

THE ANTECEDENT FACTORS OF TEACHER-CHILD RELATIONSHIP QUALITY

BY

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Abstract

High-quality relationships with teachers positively impact child academic and social outcomes. Teachers provide emotional and behavioral supports essential for success in the classroom. Less is known, however, about the antecedents of teacher-child relationship quality. This study examined the roles of child interpersonal skills, teacher expectations, and school racial and poverty compositions on the quality of relationships formed between teachers and children. A subsample from the Early Childhood Longitudinal Study—Kindergarten Cohort 2010-11 data set was used to fit two-level, multivariate regression models. The models evaluated the role of child interpersonal skills and moderating roles of teacher expectations and school racial and poverty compositions on teacher-child closeness and conflict. Results showed teacher-child conflict was predicted by child interpersonal skills, child and school-level internalizing and externalizing problem behaviors, and teacher expectations. School racial and poverty compositions moderated the relations between teacher expectations and teacher-child conflict. In addition, teacher-child closeness was predicted by poverty status, parent-child warmth, internalizing and externalizing problem behaviors, and interpersonal skills. School proportion of Asian students moderated the relation between teacher expectations and teacher-child conflict. Overall, findings suggest teacher-child relationship quality is associated with child socioemotional skills and teacher expectations, with school racial and poverty compositions as moderators.

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To the teachers who inspire, challenge, and motivate—
without whom I wouldn't be here today.

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Chapter 1: Introduction

“I never teach my pupils, I only attempt to provide the conditions
in which they can learn.”— Albert Einstein

Children grow and learn within complex, sociocultural contexts. Environments, from homes and schools to the larger society, exert influences on children. At the same time, children—through biological characteristics, motivational tendencies, and psychological processes—also actively shape their environments. The *interactions* between children and their environments are the foundations of ecological theory. Ecology is the study of interactions between organisms and their physical surroundings. An ecological perspective on human development is a framework to understand the nature of person-environment interactions, how they change over time and shape human development and learning.

In the 1970s, Urie Bronfenbrenner, along with his contemporary James Gibson, introduced their ecological frameworks. Their theories were reactions to the restricted scope of developmental research, which, at the time, was dominated by experimental methodologies (Tudge, Gray, & Hogan, 1997). To them, understanding developmental phenomena requires studying individuals in context (i.e., in their natural settings). Gibson was interested in physical development, specifically perception, and the dynamic relations between the perceiver and the perceived. Bronfenbrenner was interested in social development and the processes that underlie relationships between individuals and their environments.

By the 1980s, research using the ecological approach was more common but these studies overemphasized context, and minimized, if not discounted, the role of individuals in shaping their environments (Bronfenbrenner & Morris, 2006; Tudge, Mokrova, Hatfield, & Karnik, 2009). In later revisions, Bronfenbrenner placed proximal processes at the core as the “engines” of

development. *Proximal processes* are reciprocal interactions between individuals and their immediate environments. The definition covers relationships between individuals (e.g., family, peers, teachers), as well as relations between individuals and objects and ideas (e.g., playing with toys, reading books). Proximal processes vary in form, power, and content, and depend on outcomes and individual and environmental characteristics. How these proximal processes change, grow, and adapt over time directly affect developmental outcomes.

The study of proximal processes has been at the center of theory and research in child development and developmental psychology since the early 1920's. Jean Piaget (1925) studied cognitive development, how children acquire the ability to think abstractly and reason logically. In his research, children's interactions with ideas and objects were essential to understanding how they develop mentally.

Similar research was conducted in the 1950's and 1960's to better understand personality development. John Bowlby (1969/1982) and Mary Ainsworth (1979) were interested in how family relationships, specifically infant-mother attachment, affected children's later adjustment and personality. Bowlby emphasized the importance of family interactions in shaping the personality and development of maladjusted children (Bretherton, 1992). The cause of children's emotional or behavioral problems was not only internal conflicts or libidinal drives, but also mothers' parenting styles or approaches. Ainsworth, who joined Bowlby's lab early on in her career, developed the methodology to assess the type and quality of attachment (Bretherton, 1992).

Bowlby's and Ainsworth's research on infant-mother attachment paved the way for future research on adult-child relationships. The research evidence is clear: strong, warm relationships with caring adults provide children with the emotional and behavioral supports they

need to be successful in school and life. Infants who are securely attached to their mothers are more likely to be children and adults with better interpersonal relationships (Roisman & Groh, 2011). Similarly, children who have warm, supportive relationships with their teachers participate in class, have positive work habits, and perform better academically (Hamre & Pianta, 2001; Ladd et al., 1999).

Relationships matter. In the early years of schooling, teachers play a significant role in children's lives. They not only teach academic skills, but also social and self-regulation skills—how to interact with peers, communicate needs, interpret and control emotions, etc. Much research has documented the link between teacher-child relationship quality and child outcomes. In contrast, we know less about the processes by which quality relationships are formed.

The purpose of this study is to investigate the antecedent factors of teacher-child relationship quality. Specifically, the following research questions are investigated: What is the role of child interpersonal skills on teacher-child relationship quality? Do teacher expectations moderate the relations between child characteristics on teacher-child relationship quality? Do school racial and poverty compositions moderate the relations between teacher expectations and teacher-child relationship quality? I will use multilevel, multivariate regression to evaluate the research questions with the Early Childhood Longitudinal Study—Kindergarten Cohort:2010-11 (ECLS-K:2011). Findings from this study can inform interventions and teacher training programs designed to improve teacher quality and children's learning experiences.

Chapter 2: Literature Review

Theoretical Frameworks

Historically, attachment and developmental systems theories have served as frameworks for conceptualizing adult-child relationships (Myers & Pianta, 2008; Sabol & Pianta, 2012). Attachment theory focuses on the relationship between children and their primary caregivers.

Much research has demonstrated the link between early attachment and child outcomes: securely attached infants, generally, become children and adults with better interpersonal relationships and fewer problem behaviors (Roisman & Groh, 2011). Children who have secured attachments to parental figures are provided with the emotional and behavior supports necessary for positive development.

Developmental systems theory also focuses on relationships, but expands the model to include different contexts. The theory assumes that interactions between persons and environments are the foundations of development (Bronfenbrenner, 1994; Sabol & Pianta, 2012). Interactions between adults and children occur in the proximal, immediate environments (e.g., home, school), but those interactions can be influenced by factors in the distal, broader environments (e.g., culture, society). Other frameworks, including motivation and sociocultural, have also been used to conceptualize teacher-child relationships, but, in early childhood, many researchers rely on ideas from the attachment and developmental systems literature (Davis, 2003; Sabol & Pianta, 2012).

The focus of this research is on the relationship between teachers and children in first grade. This section reviews the conceptual or theoretical frameworks behind the teacher-child relationship literature. How are teacher-child relationships different from parent-child relationships? How is teacher-child relationship defined and measured? What theoretical frameworks are used to guide this study?

Teacher-child relationships. Children's relationships with teachers share similar characteristics to relationships with primary caregivers. Both types of relationships are dyadic systems that provide external supports for the development of academic, social, emotional, and self-regulatory outcomes (Pianta, 1997). Empirical work shows the correlation between maternal

attachment and teacher-child relationships is zero to moderate. There is some evidence of concordance between parent-child relationships and teacher-child relationships (O'Connor & McCartney, 2006; Rydell, Bohlin, & Thorell, 2005; Sabol & Pianta, 2012). In one study, children's 36-month attachment security has been associated with the quality of child care and kindergarten teacher-child relationships (O'Connor & McCartney, 2006). In contrast, another study shows no concordance between 12-month infant attachment and child care teacher-child relationship (Howes & Hamilton, 1992).

The zero to moderate concordance between attachment and teacher-child relationship quality may be due to discontinuity in attachment security over the lifespan. Longitudinal predictions of infant attachment security are generally weak, and researchers have yet to account for circumstances and experiences that may change attachment security, such as changes in family structure and relationships (Thompson, 2000). In addition, children's mental representations of relationships change over time as they acquire new experiences and form relationships with other adults. Infant and toddlerhood attachments inform subsequent relationships but adult-child relationships are not dependent on previous attachment. Teacher-child relationships, especially those formed in later childhood, can be considered a distinct type of social relationship from attachment to parents.

Definition and measurement. Researchers have used various methods, depending on their theoretical frameworks, to measure teacher-child relationship quality. Attachment theorists have defined teacher-child relationships along dimensions of attachment. For example, Howes and Smith (1995) use the Attachment Q-Set to measure teacher-child interactions. The Attachment Q-Set is an observational measure with 90 items, which observers complete during a 2-hour period of observation. Security scores can be obtained along dimensions of attachment:

secure, avoidant, and ambivalent. In addition, teacher-child quality can also be observed in the classroom using coding systems, such as the Classroom Observation System for Kindergarten (COS-K). Pianta and colleagues (2002) use the COS-K to assess classroom quality. Interactions between children and teachers, as well as teacher's and children's behaviors are coded. Global ratings of classroom dimensions, based on notes and codes, are used to describe teacher-child interaction quality, such as overcontrol, and positive emotional climates.

Moreover, self-reports of teacher-child relationship quality have also been used. The most frequently used measure is the Student-Teacher Relationship Scale (STRS) developed by Pianta and colleagues (Pianta, 2001). The STRS is a measure of teachers' perceptions of their relationships with a particular student; the age range is pre-school through third grade. There are three dimensions: Conflict, Closeness, and Dependency. The Conflict subscale measures the degree to which a teacher perceives the relationship is negative and conflictual. The Closeness subscale measures the degree to which a teacher experiences affection, warmth, and open communication with a student. The Dependency subscale measures the degree to which a teacher perceives a student as overly dependent. The 28-item STRS is assessed using a 5-point Likert-type scale. Scores can be used to assess student-teacher relationship quality, as well as inform consultation and intervention efforts.

The STRS was normed on a sample of children from 4 to 8 years old. The sample consisted of 63% White, 18% Black, 10% Hispanic, and 1.7% Asian. Children were from a range of socioeconomic status (SES): family income ranged from \$6,000 to \$150,000 and mothers' education levels from some high school to graduate degree. Studies on the psychometric properties of the measure provided evidence for its reliability and validity (Pianta, 2001). The measure was internally consistent (Cronbach's alpha above .80) across the total norm

sample for the Conflict and Closeness subscales. The Dependency subscale, however, did not have high internal consistency ($\alpha = .64$). This lack of reliability may have resulted in less usage of the Dependency subscale as a dimension of teacher-child relationship quality in research studies. In addition, reliabilities for all subscales were lower for Black and Hispanic children: $\alpha = .76$ -.78 for Closeness; $\alpha = .55$ -.56 for Dependency). For the Conflict subscale, however, internal reliabilities were higher $\alpha = .88$ -.89. Furthermore, there were also differences across gender: Conflict was higher for boys ($\alpha = .88$ versus .86) and Closeness higher for girls ($\alpha = .82$ versus .78). These differences across groups suggest the constructs of conflict and closeness may not operate in the same way or hold the same meaning across groups.

Evidence for validity was provided on the internal structure and relations to other variables. The measure developers conducted exploratory factor analysis with a norm sample and showed three factors could be extracted (Pianta, 2001). Independent research with the STRS showed a three-factor model was a good fit with modifications or revisions of two items (Webb & Neuharth-Pritchett, 2011). Subsequent investigation with a Dutch sample showed adequate fit for a three-factor model, with measurement invariance across gender and from preschool to early elementary grades (Koomen, Verschueren, van Schooten, Jak, & Pianta, 2012). More research, however, needs to be conducted because measurement invariance across race/ethnicity has yet to be demonstrated (Webb & Neuharth-Pritchett, 2011). Overall, these studies provide evidence for the internal structure, the multidimensionality of teacher-child relationship quality. In general, the items on the STRS grouped together into positive (Closeness) and negative aspects (Conflict, Dependency) of relationship quality. Across different samples, the negative aspects correlated negatively with the positive aspect (e.g., Birch & Ladd, 1997).

Additional evidence for the STRS can be found in studies showing patterns of correlations with other variables. The Closeness subscale correlated positively with academic achievement, positive work habits, and social competence (Baker, Grant, & Morlock, 2008; Hamre & Pianta, 2001; Murray & Murray, 2004; Pianta & Stuhlman, 2004). The Conflict and Dependency subscales correlated negatively with academic and social outcomes and positively with behavioral problems (e.g., disciplinary infractions, internalizing/externalizing behaviors). Furthermore, one study showed convergence among teacher- and other-rated perspectives on teacher-child relationship quality (Doumen et al., 2009). The Closeness subscale correlated positively with child-rated closeness, peer nominated closeness, and external observations of closeness (e.g., enjoyment of physical contact). Closeness also showed, overall, zero to low negative correlations with other measures of conflict and dependency. Similar results were seen for the Conflict subscale, but the Dependency subscale had mixed evidence.

In sum, results from previous studies provide reliability and validity evidence for the STRS. Teacher-child relationship quality, as measured by the STRS, is multidimensional and dimensions are correlated with similar constructs measured with different methods. It is important to note, however, that there is less evidence to support the use of STRS with minority children. Internal reliabilities of the subscales differ for Black and Hispanic versus White children and measurement invariance across race/ethnicity has yet to be demonstrated. In addition, the constructs used in the STRS (Closeness, Conflict, Dependency) may not operate in the same way or may not be interpreted in the same way across groups. For example, teachers may interpret and categorize behavior differently depending on the students' gender or race. Furthermore, it is unclear whether the STRS items were written to be applicable across cultural

contexts. Thus, researchers using the STRS should interpret results with these limitations in mind.

This study used data from the Early Childhood-Longitudinal Study—Kindergarten Cohort 2010-11 (ECLS-K:2011) study, which used the short-form of the STRS that included 15 items and two subscales. The data set included total scores for the Conflict and Closeness subscales. Data were not available at the item level; in this study, total scores for each subscale were used and assumed to be observed variables. High-quality teacher-child relationship was defined as low conflict and high closeness. More information about the STRS in the ECLS-K:2011 study can be found in the manual (Tourangeau et al., 2015).

Ecological systems. This study is grounded in the ecological systems framework, a type of developmental systems theory. An ecological systems approach assumes that the child is embedded within various contexts, including the family, school, neighborhood, and society (Bronfenbrenner, 1994; Rimm-Kaufman & Pianta, 2000; Ramey & Ramey, 1999). The interactive influences among distinct systems or contexts impact children's development and learning. Bronfenbrenner's (1994; 1999) bioecological model describes nested structures (environments) as contexts for development: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. The *microsystem* refers to the processes (e.g., interpersonal relationships, pattern of activities) experienced by the child in the immediate environment. Examples of microsystems include family, school, and peer group. The *mesosystem* refers to the interactions between different microsystems. Examples of mesosystems include the relations between home and school, and school and work.

The *exosystem* refers to interactions between different microsystems, with at least one microsystem that includes the child. An example of an exosystem is the relation between home

and family social network, and how it indirectly affects the child. The *macrosystem* refers to the patterns of interactions between micro-, meso-, and exosystems within a culture or subculture. Examples of macrosystems include belief systems, life styles, and opportunity structures within a society. Lastly, the *chronosystem* refers to the stability of individual characteristics and environments over time. An example of a chronosystem is changes in family structure and SES because of historical events.

Environment is a core component of the model. However, it is not only objective experiences of environments, but also subjective experiences—how individuals perceive their experiences in their environments—that affect development. The other core component of the bioecological model is *process*, outlined in two propositions: (1) human development occurs through progressively complex reciprocal interactions (*proximal processes*) between the individual and the immediate environments; and (2) the form, power, content, and direction of proximal processes will vary depending on individual characteristics, the environment, and developmental outcomes (Bronfenbrenner, 1994; 1999; Bronfenbrenner & Morris, 2006).

These propositions can be tested using a process-person-context-time model (PPCT). The *process* component refers to the proximal processes that occur in the microsystems that directly involve the child (e.g., mother-child interactions, peer relationships). Bronfenbrenner considers proximal processes to be the primary mechanisms of development. The *person* component refers to the biological and psychological characteristics of the individual, and this component can include the person as both the producer and product (outcomes). The *context* component refers to the nested environmental structures: micro-, meso-, exo-, and macro-systems. A similar division is seen in the *time* component. From micro-time (during specific activity) to macro-time (the chronosystem changes). The time component takes into account how proximal processes change

over time, over the life course of the individual. Together, these four components make up the core principles of the bioecological model and should be incorporated in research designs, when possible (Tudge et al., 2009).

The bioecological framework shows that outcomes result from person-environment interactions in a PPCT model. In this study, the proximal process of interest is the teacher-child relationship. Teachers are important non-familial adult figures for young children and the quality of teacher-child relationships has been linked to academic and social outcomes in the first few years of school (Birch & Ladd, 1997; Hamre & Pianta, 2001; Ladd, Birch, & Buhs, 1999; Pianta & Stuhlman, 2004). Second, the person component refers to individual characteristics, including biological liabilities or assets, behavioral dispositions, and motivational and emotional tendencies, that have direct impact on proximal processes. Child characteristics, including gender, age, and race, have been linked to the quality of teacher-child relationships (Baker, 2006; Kesner, 2000; Saft & Pianta, 2001). Child cognitive and non-cognitive skills have also been linked to relationship quality (Jerome, Hamre, & Pianta, 2009; O'Connor & McCartney, 2006; Rydell et al., 2005). Third, the context component refers to the different contexts (e.g., microsystems, mesosystems) of development. This study looks at the mesosystem by investigating the moderating effects of school racial and poverty composition on the quality of teacher-child relationship quality. Lastly, this study is cross sectional so the time component is not incorporated. Teacher-child relationship quality measures are only available for wave 4, spring of first grade.

In sum, the bioecological systems model provides a theoretical framework to understand the processes and environments that affect child development and learning. This study uses that framework to explore how child characteristics and skills are related to teacher-child relationship

quality. The goal of this study is to understand the process or formation of teacher-child relationships within a bioecological framework. Understanding the implications of relationship quality—i.e., that it affects child outcomes—is only the first step to improving outcomes. Intervening to improve those relationships requires that researchers and practitioners identify key factors that impact relationship quality to inform the development of programs and innovations.

Teacher-Child Relationship Quality and Child Outcomes

Entrance into formal schooling marks a change in children's social network: teachers become non-parental adults with whom children spend a significant amount of time. In early childhood and elementary grades, the quality of teacher-child relationships impacts child social and academic outcomes. Positive, high-quality relationships with teachers—defined as high trust and warmth, and low conflict—predict better outcomes, including reading and math achievement (Baker, 2006; Burchinal, Peisner-Feinberg, Pianta, & Howes, C., 2002; O'Connor & McCartney, 2007), social skills (Baker, 2006; Pianta & Stuhlman, 2004), classroom participation and engagement (Birch & Ladd, 1997; Hughes & Kwok, 2007; Ladd et al., 1999), and school liking (Birch & Ladd, 1997; Ladd & Burgess, 2001). Positive teacher-child relationships also predict lower negative outcomes, including internalizing and externalizing problem behaviors (Maldonado-Carreño & Votruba-Drzal, 2011; O'Connor, Dearing, & Collins, 2011; Pianta & Stuhlman, 2004), suspension (Decker, Dona, & Christenson, 2007), and disciplinary infractions (Hamre & Pianta, 2001).

In addition, studies have shown negative, conflicting relationships with teachers are stronger predictors of outcomes than positive relationships (Baker, 2006; Ladd et al., 1999; Pianta & Stuhlman, 2004). The apparent stronger impact of negative relationships could be due to early childhood being a sensitive period for building social networks and establishing positive

relationships with non-familial adults. Moreover, studies show teacher-child relationship quality is a stronger predictor of social outcomes than academic outcomes (Baker, 2006; Birch & Ladd, 1997; Hamre & Pianta, 2001; Pianta & Stuhlman, 2004). High-quality teacher-child relationships support children's social development by providing a source of emotional and behavioral support in the classroom.

Furthermore, for studies that included covariates, the quality of teacher-child relationship has shown to be a unique predictor, above and beyond child and family characteristics, including child gender, child previous achievement, maternal education, maternal attachment, and family practices (Burchinal et al., 2002; Hamre & Pianta, 2001; O'Connor & McCartney, 2007). A meta-analysis of person-centered teacher variables shows an effect size of .35 to .43 on student outcomes, including cognitive, social, and school engagement (Cornelius-White, 2007). The moderate correlations between teacher variables (e.g., empathy, warmth, genuineness, etc.) and outcomes suggest that teacher-child relationship quality is worth pursuing in research and interventions.

Relationship quality as a protective factor. For at-risk children, the quality of teacher-child relationship is even more important because it moderates the negative impact of risk factors. High-quality teacher-child relationships can serve as a protective factor for children with high problem behavior and low maternal attachment (Baker, 2006; Hamre & Pianta, 2005; O'Connor & McCartney, 2007; O'Connor et al., 2011). For children who have early problem behaviors, a negative or worsening teacher-child relationship is associated with higher internalizing behavior in fifth grade (O'Connor et al., 2011). Children with high-quality relationships over time show similar levels of internalizing behavior to their peers who started school with low early problem behaviors. Similarly, children who have high externalizing

problems tend to have lower reading achievement, but only when they *also* have poor relationships with teachers (Baker, 2006). These studies suggest positive relationships with teachers serve as a protective factor for worsening behavioral problems.

Moreover, the impact of teacher-child relationship quality on outcomes may be stronger for minority and low-income children. The few studies that have looked at this, some indirectly, show the relation between teacher-child relationship quality and child outcomes differ by racial groups (Burchinal et al., 2002; Dee, 2005; Hamre & Pianta, 2005; Meehan, Hughes, & Cavell, 2003). Teacher-child closeness is more strongly related to language skills for Black and Latino children compared to White children (Burchinal et al., 2002); teacher support is associated with less aggression in Black and Hispanic children compared to White children (Meehan et al., 2003); and teacher instructional support is associated with higher academic achievement for children whose mothers have low education, some college or less (Hamre & Pianta, 2005). Together, these studies provide evidence of a moderation effect, wherein the impact of teacher-child relationship quality on outcomes differs for minority and low-income children.

Summary. In sum, there is considerable research evidence linking high-quality teacher-child relationships to positive social and academic outcomes. Children who have warm, supportive (e.g., open communication, emotional support) relationships with their teachers participate in class, feel engaged with academics, have positive work habits, and are less likely to act out. Research on the antecedents of relationship quality, however, is less comprehensive, and in some areas, ambiguous.

We need to know the factors that influence the type and quality of relationships formed to change or improve teacher-child relationships, and thereby, indirectly improve outcomes. The sections below review previous research on the antecedents of teacher-child relationship quality.

What child characteristics and skills influence the quality of teacher-child relationships? What is the role of teacher expectations? Does the school context make a difference?

Antecedents of Teacher-Child Relationship Quality

Child characteristics. The relationship quality between children and teachers is influenced by child characteristics, including gender and race. Teachers tend to report more closeness with girls and more conflict with boys (Baker, 2006; Birch & Ladd, 1997; Hamre & Pianta, 2005; Jerome et al., 2009; Kesner, 2000; O'Connor & McCartney, 2006). Teachers' relationships with girls are defined by more closeness, trust and warmth. In contrast, teachers' relationships with boys are defined by more conflict, negativity (e.g., anger, resistance). Gender also predicts growth in teacher-child closeness over time: for boys, there is a greater decrease in teacher reports of closeness over time (Jerome et al., 2009). This results in a greater gap between girls and boys on teacher-child closeness by middle elementary grades. The gender differences in teacher-child relationship quality in early elementary grades may be related to skills and attributes (e.g., behavior, achievement). On average, boys tend to come to school with lower levels of social competence and higher problem behaviors (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Halle, Hair, Wandner, & Chien, 2012).

Race is another child characteristic that is associated with the quality of teacher-child relationship. White children, compared to Black children, tend to be rated as having better relationships with teachers. White children are more likely to receive positive interactions (e.g., praise, teacher-directed attention) in the classroom (Casteel, 1998; Howes & Smith, 1995). Teachers also tend to report lower conflict and negativity with White children compared to Black children (Jerome et al., 2009; O'Connor & McCartney, 2006). In addition, Black children are rated by White teachers as more prone to show externalizing behaviors, greater dependency, and

less likely to show attentiveness, task persistence, and eagerness to learn (Downey & Pribesh, 2004; Kesner, 2000).

Moreover, from kindergarten to sixth grade, there is a greater increase in teacher-child conflict for Black compared to White children (Jerome et al., 2009). This results in a greater gap in teacher-child conflict between Black and White children, which is more pronounced starting in late elementary and early middle school compared to kindergarten. In addition, the conflict ratings are from different teachers over the school years, suggesting some continuity in relationship experiences associated with race. No differences, however, are seen between White and Hispanic children in terms of their relationships with teachers (Jerome et al., 2009; O'Connor & McCartney, 2006; O'Connor & McCartney, 2007). But these findings may be due to the small sample of Hispanic children in these studies, making it difficult to detect effects. It is also difficult to compare racial groups because some studies place all minority students into one group (Kesner, 2000).

Studies have also shown the interaction between gender and race is predictive of relationship quality. Teachers report more conflict with minority girls compared to White girls (Saft & Pianta, 2001). There is, however, no gender or race effect reported for closeness. Similarly, another study shows no interaction effect for closeness or conflict (Jerome et al. 2009). These two studies reflect an initial investigation into the interaction between gender and race—more research needs to be conducted. These studies are also limited in their samples; with predominantly White, high SES samples, race effects may be harder to detect.

In sum, the research shows child gender and race are factors that influence relationship quality with teachers. While reasons for the race associations are not entirely clear, there is evidence that teachers may expect less from minority students, possibly based on teachers'

stereotypes and beliefs (McKown & Weinstein, 2008; Rubie-Davies, Hattie, & Hamilton, 2006). These stereotypes and beliefs could lead to lower relationship quality due to differential treatment. In addition, it may also be due to child skills or attributes: minority children come to school with lower school readiness skills (Hair et al., 2006). The association between gender and race to teacher-child relationship quality may be explained by kindergarten entry skills, including cognitive and socioemotional. The literature is reviewed below.

Child cognitive and socioemotional skills. Children who start school with higher academic, social, and self-regulation skills have higher academic achievement and lower behavioral problems in later grades (Duncan et al., 2007; Hair et al., 2006; La Paro & Pianta, 2000). There are, however, differences or gaps in children's school readiness skills: minority, male, and children from economically disadvantaged families enter kindergarten with below average cognitive, language, and socioemotional skills (Hair et al., 2006; Werthheimer & Croan, 2003). Lack of school readiness skills not only impacts future outcomes, but also relationship quality with teachers.

Early childhood cognitive skills are typically defined as pre-reading and pre-math skills, measured by assessments such as the Woodcock-Johnson or the Peabody Picture Vocabulary Test; in some studies, student grades or teacher reports are also used. Children who score low on these measures of academic achievement tend to have lower relationship quality with teachers. Academic achievement is a unique predictor of teacher-child closeness and conflict, beyond other factors, including child characteristics and behavioral problems, and maternal education (Jerome et al., 2009; O'Connor & McCartney, 2006). Children with lower achievement have lower closeness and higher conflict with teachers. The effect of achievement on relationship quality is small, however.

In contrast, larger effects are seen for early childhood socioemotional skills. In the early childhood literature, children's social and emotional competence can be defined as social competence or prosocial skills in the classroom, as well as internalizing and externalizing problem behaviors. These constructs are measured using standardized assessments, such as the Achenbach Child-Behavior Checklist, or teacher- and parent-reports. Studies show children with high internalizing and externalizing problem behaviors have higher conflict and lower closeness with teachers. Externalizing problem behavior and general problem behavior uniquely predict kindergarten teacher-child relationship quality, beyond child characteristics and maternal education (Jerome et al., 2009; O'Connor & McCartney, 2006).

Similarly, both externalizing and internalizing problem behaviors predict teacher-child conflict, beyond race, gender, and school engagement (Murray & Murray, 2004). But no effects are seen for teacher-child closeness. Another study shows inhibited and hyperactive children, compared to the average, are more likely to have lower closeness (Thijs & Koomen, 2009). Moreover, children considered at high risk due to low academic achievement and social skills *and* high externalizing problems are more likely to experience conflict with teachers (Hamre & Pianta, 2005). Together, these studies suggest children's problem behaviors influence the quality of teacher-child relationships. Children with high internalizing problems are more likely to be shy, inhibited, and withdrawn, making it difficult to form close relationships with teachers. Children with high externalizing problem behaviors are more likely to act out and be aggressive, making it harder to connect to teachers.

Surprisingly, few studies reviewed above include a measure of children's social competence as an antecedent factor of teacher-child relationship quality. But there is evidence for low to moderate correlations between relationship quality and social skills. Children with

higher social skills have lower conflict and higher closeness with teachers (Baker, 2006). And those with antisocial behavioral styles have higher conflict and lower closeness with teachers (Ladd et al., 1999). In addition, a meta-analysis of person-centered teacher variables shows a correlation of .32 with student social connections/skills (Cornelius-White, 2007). Moreover, we know teacher-child relationship quality predicts child social outcomes (e.g., Baker, 2006; Pianta & Stuhlman, 2004). The effect is also likely to be reciprocal, wherein child social skills predict teacher-child relationship quality. But few studies have looked explicitly at that relation.

Overall, research shows children's academic skills and problem behavior predict teacher-child relationship quality. Teachers may invest less time and effort in developing relationships with children who are low achieving (children they believe to have low potential for success). Teachers may also find it hard to connect and form positive relationships with children who have difficulties managing emotions and behaviors. When this literature is integrated with the research on child characteristics, the findings suggest that relations between child characteristics, specifically race and gender, and relationship quality may be explained by children's cognitive and socioemotional skills. For example, the associations between race and gender and relationship quality are not significant when problem behaviors are in the model (Murray & Murray, 2004; O'Connor et al., 2006). These results can be interpreted as children's problem behaviors (internalizing and externalizing) are explaining more of the differences in teacher-child relationship quality compared to race and gender.

Summary. Previous studies show that child race, gender, academic skills, and problem behavior are associated with the quality of teacher-child relationships. Teachers tend to have lower quality relationships with minority (Black and Hispanic) children, males, and children with low academic and high problem behavior. The role of child social skills, however, has yet to be

empirically evaluated. This study fills that gap—and extends the research by considering the potential moderating roles of teacher expectations and school composition.

The Role of Teacher Expectations

Teachers have beliefs and expectations about their students—e.g., beliefs about intelligence, likelihood of success, level of motivation, etc. Teachers' expectations can impact children's achievement by affecting the goals that are set for students, resources that are allocated, and relationships that are formed. Children who are the targets of high teacher expectations benefit from challenging goals, increased attention, greater opportunities to participate, and more informative feedback (Jussim, Madon, & Chatman, 1994).

The quality of teacher-child relationship may also differ based on expectations. Relationship quality is an indicator of the strength of emotional attachment between teachers and children. Children who are the targets of high expectations may have closer relationships with teachers who are paying more attention and providing extra support. But the association between teacher expectations and teacher-child relationship quality has yet to be evaluated empirically—this study addresses that gap. The remainder of this section summarizes the literature on teacher expectations, teacher behavior, and the relations to children's outcomes.

Defining and assessing teacher expectations and teacher behavior. Teacher expectations are defined broadly as beliefs teachers have about their students. In the literature, definitions of teacher expectations differ depending on the aims of the study. For example, expectations have been defined as teachers' subjective rankings or levels of achievement (Brophy & Good, 1970; Cooper & Baron, 1977; Kuklinski & Weinstein, 2000; McKown & Weinstein, 2008), beliefs or ratings of academic abilities and behavior (Diamond, Randolph, & Spillane, 2004; Downey & Pribesh, 2004; Jussim & Eccles, 1992; Madon et al., 2001; Pigott &

Cowen, 2000), and beliefs of students' academic potential (Beady & Hansell, 1981; Good, Cooper, & Blakey, 1980; Van den Bergh, Denessen, Hornstra, Voeten, & Holland, 2010). These various definitions and ways of assessing teacher expectations make it difficult to compare results across studies. Despite this variability, the common assumption is that these different operationalizations tap into a general latent teacher expectations construct. In this study teachers' evaluation of students' future academic prospects was the measure of teacher expectations.

Teacher behavior in the classroom has been documented using observational measures. Observers look for a variety of behaviors, including teacher instructional quality, teacher response to behavior, teacher-initiated contact, teacher praise and criticism, as well as the interactions between teachers and children (Brophy & Good, 1970; Howes & Smith, 1995; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005). Relationship quality has been measured using observational measures, as well as self-reports (e.g., Pianta, 2001). The quality of teacher-child relationship is affected by a range of teacher and child characteristics and behaviors. Teachers' perceptions of the teacher-child relationship are based on previous interactions, which shape their predicted future behavioral and emotional interactions. For example, a teacher may think that one child will seek comfort from her if upset (or vice versa) based on both on experience with and expectations about the child. In such a case, the teacher believes there is an emotional connection, where the child feels the teacher is someone, he/she can depend on, who can offer emotional support.

Relationship quality and teacher behavior are interdependent and reciprocal. Teachers' behaviors, positive or negative, affect the quality of the teacher-child relationship, and, in turn, the quality of the teacher-child relationship, positive or negative, affects teachers' subsequent behaviors. The interdependent and reciprocal nature of relationship quality and teacher behavior

makes it difficult to disentangle within a research study. Thus, in this study, I treat teacher-child relationship quality as an indicator of teacher behavior. Because the research shows teachers' expectations influence teacher behavior (e.g., Brophy & Good, 1970), I also expect that teacher expectations will also influence teacher-child relationship quality.

Teacher expectations accuracy and outcomes. Early research on teacher expectations spurred debate among scholars about the accuracy and the impact of expectations on outcomes. Rosenthal and Jacobson's (1968) Pygmalion study was the first experimental study to show a strong teacher expectation effect. In that study, children were assigned to one of two conditions: late bloomers and control. In the late bloomers condition, teachers were told that the children in this group would experience exceptional intellectual growth in the later years. In the control condition, teachers received no information about the intellectual growth potential of children. Results showed that children in the late bloomers condition gained on average more IQ points ($d = .30$) than children in the control condition. Initial reactions from the public were strong, both positive and negative, and findings were used to support the argument that social stereotypes and erroneous teacher expectations contributed to educational inequality (Jussim & Harber, 2005). Rosenthal and Jacobson's study (1968) has been replicated and expanded upon in the last 30 years.

Social psychologists who accepted the Pygmalion study at face value emphasized the power of self-fulfilling prophecies (Jussim & Harber, 2005). Self-fulfilling prophecy is defined as an effect of teacher expectations on student outcomes in which teachers' erroneous expectations (high or low) lead students to perform at levels consistent with the (erroneous) expectations. Self-fulfilling prophecy implies teachers' expectations are incongruent with student's actual performance or potential, which affects how teachers interact and instruct.

Teachers' expectations may be incongruent for various reasons, including skewed perceptions, negative stereotypes, and bias. Teachers own identities and ideologies can also affect their expectations (Warren, 2002).

Studies in the educational psychology literature have mainly examined the accuracy of teacher expectations, and the results, for the most part, show teachers make accurate evaluations of student achievement (Jussim & Harber, 2005). To assess the accuracy of teachers' expectations, researchers typically compare teachers' ratings with other measures, such as standardized performance or previous grades. For example, Jussim and colleagues (1996) show that fall teacher ratings of student performance correlated with previous grades. These findings also show that accuracy of teacher judgments depends in part on access to previous information about students' performance. Teachers who know their students or have previous knowledge of achievement will be more accurate in expectations and ratings. The effect of teacher expectations on academic outcomes, however, is small, around 0.1 to 0.2 (Jussim, Eccles, & Madon, 1996; Jussim & Harber, 2005). This small effect on outcomes may be due to the accuracy of judgments about students' performance.

Accuracy in judging student academic performance, however, does not necessarily mean the absence of bias (Ferguson, 2003). Accuracy cannot explain why there are differential effects of teacher expectations for different groups of students. Research has found that the effect of teacher expectations on student outcomes differs by child characteristics: teacher expectations effects are stronger for girls, Black students, and students from low-SES (Jussim et al., 1996). In addition, even though teacher expectations may be accurate, students may respond differently to those expectations. For example, research on stereotype threat shows students' anxiety about conforming to negative stereotypes from teachers can hinder their performance (Steele, 1997).

Also, teachers' negative expectations of minority groups can influence student behavior and subsequently their achievement, which can create a self-fulfilling prophecy effect.

In sum, the research literature suggests that child gender, SES, and race are moderators of the effect of teacher expectations on academic outcomes and that teacher expectation effects are not necessarily consistent across different groups. This study evaluates the moderating role of teacher expectations on teacher-child relationship quality.

Differential expectations based on race, gender, and social class. There is evidence that teachers have different expectations for students based on race, gender, and social class. A meta-analysis of teacher expectations research shows an average effect size of .23 favoring White children over minorities (Tenenbaum & Ruck, 2007). Broken down, the effect sizes are .25, .46, and -.17 for Black, Latino, and Asian children, respectively. Teachers' expectations of achievement, on average, are lower for Black and Latino students and higher for Asian students compared to White students. In the same study, it is also shown that teachers were less likely to refer minorities for gifted education ($d = .92$) and *more* likely to refer minorities for special education ($d = -.25$) and disciplinary action ($d = -.30$).

In addition, there is evidence that teachers' expectations of academic achievement are lower for Hispanic and Black students, even when their academic records are comparable with White and Asian students (McKown & Weinstein, 2008). Moreover, child race is not only associated with teacher expectations, but also with teachers' stereotypes. One study shows teachers associate Black children with more negative adjectives, such as irresponsible, lazy, and disobedient (Piggott & Cowen, 2000). The same study also shows teachers had lower expectations about Black children graduating from high school.

Similar results have been documented in studies from other countries. Despite similar levels of achievement, teachers' initial expectations are lower for Maori students, an ethnic minority in New Zealand (Rubie-Davies et al., 2006). At the end of the year, however, teachers' judgements of Maori students are comparable to their actual achievement. Teachers, however, still show inaccuracies by perceiving Pacific Island students to be performing higher than their actual performance. In addition, another study shows teachers have higher expectations for Dutch-origin students compared to Turkish-Moroccan-origin students (Van den Bergh et al., 2010). There is also evidence that negative expectations for minority students already existed before teachers begin service. Preservice teachers, in one study, have negative expectations for Black and Native American students, perceiving that those students were more likely to have low motivation, low parental support, and lower giftedness and talent (Terrill & Mark, 2000). Overall then, these studies show child race can influence teacher expectations, with a tendency for teachers to have lower expectations for minority students compared to majority students.

In contrast, the research on gender effects is mixed. One study shows teachers have different expectations for boys and girls, perceiving boys as having more innate talent and girls as achieving higher and expending more effort (Jussim & Eccles, 1992). However, other studies have shown that gender was not correlated with nor predicted teacher expectations. In addition, another study shows teachers tend to rate boys and girls at similar levels on expected year-end achievement (McKown & Weinstein, 2008). Moreover, gender did not predict teachers' perceptions of performance, ability, and level of educational attainment when race, SES, and implicit attitudes are controlled for (Van den Bergh et al., 2010). In some studies, gender has not been included as a covariate or predictor (Piggott & Cowen, 2000; Rubie-Davies et al., 2006).

Furthermore, there is also less research on social class and teacher expectation effects. In general, teachers tend to have higher expectations for high-SES students (Van den Bergh et al., 2010), and expectations have been associated with math achievement, but more so when teachers held implicit prejudice attitudes (e.g., negative/positive associations with groups). Unfortunately, many studies do not include SES or other measures of social class in their studies (McKown & Weinstein, 2008; Piggott & Cowen, 2000; Rubie-Davies et al., 2006).

In sum, the research literature suggests that child race and gender may be associated with teacher expectations, and there is minimal literature on the association between social class and expectations. Because teacher expectations can differ by gender, race, and social class, it is important to evaluate or at least control for these variables in research to avoid potential confounds on the associations between teacher expectations and outcomes. This study addresses this limitation by assessing the unique effects of race, gender, and social class.

Differential behavior based on expectations, race, and gender. To date, no study has assessed the association between teacher expectations and teacher-child relationship quality, as defined by closeness and conflict. Observational studies, however, have shown differential behavior based on expectations. Teachers give more praise to students in the high-expectation group, students who teachers believe to be high achieving or have academic potential; teachers are also more likely to praise high-expectation students for correct answers and less likely to criticize (Brophy & Good, 1970; Cooper & Baron, 1977; Good et al., 1980). In addition, child-initiated contact (e.g., show work, ask questions) is higher for the high-expectation group (Brophy & Good, 1970).

Two decades of research has shown teachers behavior differently toward low achievers compared to high achievers, including giving answers, rewarding inappropriate behavior, and

seating low achievers further away, etc. (Good, 1987). Moreover, teachers' perceived responsibility, their perceptions of the roles of person/environmental factors on outcomes, is correlated with child-initiated interactions (Cooper & Baron, 1977). When teachers perceive a stronger influence of personal factors in academic performance for that child, there are more child-initiated interactions. These results suggest not only is the teacher's behavior influenced by teachers' beliefs or perceptions, but also the student's behavior.

Expectations impact teachers' behavior, and, to the extent that it differs across racial groups, can increase the achievement gap. Experimental studies show race and expectations influence teacher behavior. Participant teachers teach slower and show less patience for students in the low-ability group (Taylor, 1979). Similarly, participant teachers pay more attention to students with the giftedness label and provide more praise to gifted White students (Rubovits & Maehr, 1973). In addition, race can also influence teacher nonverbal behavior. In one study, participant teachers were rated as more pleased with White students and students who were successful (Feldman & Orchowsky, 1979). Moreover, a recent study shows race is associated with participants' behavioral expectations (Yale University Child Study Center, 2016). Using an eye-track procedure, participants observe children for challenging behavior; results show participants gaze more at Black boys compared to White boys. Overall, though the experimental studies are older, they provide causal evidence for the effect of race on teacher expectations. This supports the more recent correlational studies showing differential teacher expectations based on race.

Moreover, there is evidence of a gender effect. Teachers initiate more interactions with girls, and girls in the high-expectation group are praised more often (Brophy & Good, 1970; Cooper & Baron, 1977). For boys, teachers are more likely to provide behavioral feedback

(Good et al., 1980) and to warn or criticize behavior more frequently (Brophy & Good, 1970). Gender and race also interact, with Black males receiving the most unfavorable treatment with less positive feedback (Taylor, 1979).

In sum, research shows differential teacher expectations lead to differential behavior—how teachers react, how students react, how students are treated. Teachers also behave differently toward students based on race and gender. Differential behavior may also show up in the classroom as differential emotional and behavioral supports. For students who teachers believe to be high achievers or have academic potential, teachers may put more effort into developing positive relationships. Teachers' differential expectations across racial groups may explain the gender and racial gaps in teacher-child relationship quality. Moreover, for children at risk (e.g., Black children, boys) of developing conflicting relationships with teachers, do high teacher expectations make a difference by serving as a protective factor? This study evaluates the moderating role of teacher expectations on teacher-child relationship quality.

Summary. The following connections are established in the research literature: (1) teacher expectations positively correlate with child academic outcomes; (2) child characteristics moderate the relations between teacher expectations and child outcomes; (3) teachers have different expectations for students based on race and gender; and (4) teachers behave differently toward students based on expectations, race, and gender. These connections have been made independently, in separate lines of research. The goal of this study is to connect the dots, link the findings together, and gain a better understanding of how child characteristics and teacher expectations relate to teacher-child relationship quality.

The Role of School Composition

In Bronfenbrenner's (1994; 1999) bioecological model, schools make up part of the mesosystem. Schools differ in various ways, including resources, quality of instruction, teacher experience and education, and the cultural and belief systems. These differences affect the opportunities children have to acquire cognitive, interpersonal, and intrapersonal skills. There are also group differences in access to high-quality schooling. Black and Hispanic children are more likely to attend low-SES schools, and school SES composition contributes to part of the achievement gaps (Burchinal et al., 2011; Palardy, 2015). Low-SES schools are also less likely to have access to educational materials, qualified teachers, and a variety of educational curricula (e.g., electives, extracurricular). In addition, school racial/ethnic composition can influence outcomes. White children, compared to minority children, tend to have higher reading and math achievement when they attend schools with higher percentage of racial/ethnic minority (Benner & Crosnoe, 2011). Minority children do not seem to benefit from higher racial/ethnic diversity in the school. Overall, these studies indicate school racial and social class composition can influence child academic outcomes. The sections below review the role of school composition on teacher-child relationship quality and teacher expectations.

School composition and teacher-child relationship quality. No study, to the best of my knowledge, has looked specifically at the role of school composition on teacher-child relationship quality as measured by closeness and conflict. Studies, however, have shown that classroom or school characteristics influence the classroom environment and climate. For example, one study shows classrooms with more educated and trained teachers have higher classroom quality scores (Howes & Smith, 1995). Moreover, in high-quality classrooms, research suggests that students are less likely to show noncompliance with teacher requests and

less off-task behavior in whole-class settings (Rimm-Kaufman et al., 2005). Teachers in high-quality classrooms appear to provide emotional and instructional supports for learning, which engages students in learning and reduces negative behaviors.

The classroom social climate has also been associated with school satisfaction (Baker, 1999). Results show children who are satisfied with school were more likely to report greater social support and classroom caring climate. The causal direction of this association, however, is not clear. There could be a reciprocal effect, wherein high-quality classroom climate influences school satisfaction, and children with high school satisfaction are more likely to be engaged and receive social support from teachers. In another study, students' perception of school climate (order and discipline, achievement motivation) is higher in schools with lower percentages of classroom behavior problems, smaller class sizes with more established teachers, and lower faculty turnover (Koth, Bradshaw, & Leaf, 2008). Overall, these studies show associations between classroom/school climate and children's and teacher's behavior and classroom/school characteristics.

Is there evidence that teacher-child relationship quality varies at the classroom level? That is, would we find between classroom differences in the levels of relationship quality. Studies have shown classroom variability in children's experiences (Pianta, La Paro, Payne, Cox, & Bradley, 2002). Observations show variations across classrooms in the type of contact (e.g., whole class vs. individualized). The percentage of students in a classroom receiving free/reduced-price lunch in the classroom has been correlated with lower child-centered and instructional climate (Pianta et al., 2002).

In this study, the classroom level cannot be modeled, so the school level is considered. In addition, it can be argued that every within-level variable can be aggregated and observed at the

between-level. In this study, child characteristics are within-level variables of interest. These individual-level variables can be aggregated at the school level to get the school-level variables (e.g., proportion of racial groups and poverty status in the school). Empirically, no study has investigated whether the school racial and SES compositions are related to teacher-child relationship quality. I hypothesize unique effects of school racial and poverty composition on teacher-child relationship quality.

School composition and teacher expectations. Studies previously reviewed have shown differences in teacher expectations based on student characteristics but the role of school contexts in shaping teachers' beliefs and expectations were not considered. Teachers have their own personal beliefs and ideologies that they bring to the classrooms, but their beliefs and ideologies are also shaped by the school culture and belief systems. One qualitative study suggests that school racial and social class compositions are related to teachers' beliefs about students (Diamond et al., 2004). In a majority Black, low-income school, teachers are more likely to use deficit-oriented statements about their students, including statements that students were disrespectful, lacked discipline, or too social. By contrast, in majority White and Asian schools, teachers are more likely to use asset-oriented statements (e.g., motivated, eager to learn). The authors hypothesize that positive stereotypes of the Chinese culture may have reduced the impact of low-income on teachers' beliefs. In another study, findings indicate that in predominantly Black schools, Black teachers compared to White teachers have higher expectations for students to attend college (Beady & Hansell, 1981).

Additional evidence of a classroom/school effect has been demonstrated in Tenenbaum and Ruck's (2007) meta-analysis. An expectancy effect favoring majority White students is larger in studies conducted in the South ($d = .39$) compared to the West ($d = -.14$) and Midwest

($d = .02$). Compared to the Midwest, public schools in the South are more likely to enroll Black students and schools in the West are more likely to enroll Asian/Pacific Islanders (National Center for Education Statistics, 2016). Thus, in schools that are more heterogeneous in racial composition (South and West), differential teacher expectations are more likely to occur. Existing research suggests teacher's race and school racial composition may impact teachers' expectations about students. Similarly, other studies have also shown that teacher race is associated with teacher-child relationship quality (Kesner, 2000; Saft & Pianta, 2001). Unfortunately, available data for this study (public-use data set) did not permit the inclusion of teacher-level characteristics in analyses. The school level, however, is considered by aggregating the individual-level variables.

Moreover, there is evidence that classroom differential treatment is associated with teacher expectations. Research suggests that in more diverse classrooms—higher number of ethnic groups (e.g., White, Black)—with high differential treatment of children based on cognitive skills, the gap between teachers' expectations of Hispanic and Black children and White and Asian children is larger (McKown & Weinstein, 2008). Teachers in high diverse classrooms may be more likely to cultivate climates that differentiate between low- and high-achievers, thus magnifying the achievement gap. Another study shows in high differential classrooms, compared to low differential classrooms, teachers' expectations are more stable from fall to spring (Kuklinski & Weinstein, 2000). There is also a grade effect, with stability of differential treatment lower in first grade compared to third and fifth grade, suggesting third and fifth grade teachers used students' previous performance to inform expectations.

Overall, studies have shown an association between school racial and social class compositions with teacher beliefs, perceptions, and expectations. Teachers who work in

predominately low-income schools with a majority Black students tend to have lower expectations for students. In addition, in classrooms with a higher percentage minority groups and with high differential treatment of students based on achievement, there are larger gaps between teacher expectations of minority and majority students.

Summary. The research shows there are variations in children's classroom experiences and school racial and poverty compositions may be associated with teacher expectations. To date, no study, to my knowledge, has investigated the role of school composition on teacher-child relationship quality. This study evaluates the association between teacher expectations and teacher-child relationship quality. At the school level, I investigate whether school racial and poverty compositions moderate the relations between the teacher expectations and relationship quality.

The Current Study

The purpose of this study is to investigate the antecedent factors and processes of teacher-child relationship quality. Previous studies have shown:

- (1) child gender and race influence teacher-child relationship quality;
- (2) child cognitive skills and problem behavior influence teacher-child relationship quality;
- (3) teacher expectations are associated with outcomes, and more so for girls, low-income, and Black children;
- (4) teachers have different expectations for students based on race and gender;
- (5) teachers behave differently toward students based on expectations, race, and gender;
- (6) school racial composition influences teacher expectations.

Few studies in the literature have investigated a model that includes a comprehensive set of child characteristics and skills as predictors of teacher-child relationship quality. It is important to disentangle the effects of one variable from another. For example, race and social class are confounded: Black and Hispanic children more likely to be low-SES, have mothers with lower incomes and educational levels (Duncan & Magnuson, 2005). Including only race or only SES makes it difficult to tease apart the unique effects of either. Moreover, a model with a wide range of variables allows researchers to see the unique effect of predictors of interest while controlling for relevant covariates, potentially reducing bias due to omitted variables.

In this study, I replicated and expanded the existing literature in several ways. First, the connections between child interpersonal skills and teacher expectations and teacher-child relationship quality have yet to be empirically evaluated. I assumed, in this study, that relationship quality reflects previous teacher behavior, and as previous observational and experimental studies show, teacher expectations influences teacher behavior. Thus, I expected to see a positive effect of teacher expectations on teacher-child relationship quality. Second, many previous studies are limited in the use of majority White, non-poverty samples. Estimates from these studies are not generalizable to the larger population, and a small sample of minorities may underestimate effects. This study used a subsample from a nationally representative sample of kindergarteners in the U.S. Third, this study looked at the effect of school and how school racial and poverty compositions were associated with teacher-child relationship quality. Results will inform interventions and training programs designed to improve teacher quality and children's learning experiences.

Research question and hypotheses.

Research Question 1: What is the role of child interpersonal skills on teacher-child relationship quality?

- Hypothesis 1: Child interpersonal skill is a positive predictor of teacher-child closeness and a negative predictor of teacher-child conflict.

Research Question 2: Do teacher expectations moderate the relations between child characteristics and teacher-child relationship quality?

- Hypothesis 2a: Child race and teacher expectations interact to predict teacher-child relationship quality.
- Hypothesis 2b: Child gender and teacher expectations interact to predict teacher-child relationship quality.

Research Question 3: Do school racial and poverty compositions moderate the relations between teacher expectations and teacher-child relationship quality?

- Hypothesis 3a: The effect of teacher expectations on teacher-child relationship quality is moderated by school racial composition.
- Hypothesis 3b: The effect of teacher expectations on teacher-child relationship quality is moderated by school poverty composition.

Chapter 3: Method

Data Source

The Early Childhood Longitudinal Study—Kindergarten Class of 2010–11 (ECLS-K: 2011) followed a nationally representative sample of children from fall of kindergarten in 2010 to spring of 2016. The ECLS-K:2011 was a multisource, multimethod study: data came from interviews with parents, school records, child assessments, as well as questionnaires from

principals and teachers. There were eight waves of data collection. This cross-sectional study used data from the kindergarten and first-grade waves: specifically, data from wave 4 (spring first grade) were used. Data from wave 1 was used to select the subsample.

During the base year (wave 1), 18,174 kindergarteners from 968 schools from across the U.S. participated in the study. In the fall of first grade (wave 3), the ECLS-K:2011 used a subsample instead of the full sample: a total of 6,109 children were sampled from 568 schools, of which 462 were public and 106 were private. In the spring of first grade (wave 4), all base-year respondents who had assessment scores or parent data for at least one wave of data collection were eligible to participate (Tourangeau et al., 2015).

Sample

A multistage probability sampling design was used by researchers in the ECLS-K:2011. In wave 1, the first stage of sampling was counties or groups of counties (primary sampling units), then schools were sampled within counties, and lastly children were sampled within schools. Children who were Asian, Native Hawaiians, or Pacific Islanders were oversampled to meet sampling goals. The total number of participants was different at every wave of data collection due to grade retention, attrition, or other factors.

This study used a subsample of individual students from the larger data set. Inclusion criteria were: (1) first-time kindergartener; (2) child did not change teachers between fall and spring of first grade; (3) child has scores on teacher-child closeness and conflict; and (4) only one twin in a family (because nesting at the family level is not modeled). The sample size for this study was 3643 children from 460 schools, with different levels of missingness depending on the variable (see Table 1 for descriptive statistics). The study subsample was roughly half the size of

the full sample ($N = 6,109$) that was available in the larger data set due to subsampling in fall of first grade.

Sample characteristics. After removing cases that did not meet the inclusion criteria, the analysis sample size was $N = 3643$. Children were White (40%), Black (10%), Hispanic (35%), Asian (8%), and Other (7%), made up of Native Hawaiian/Pacific Islander, American Indian/Alaska Native, or more than one race. Approximately 48% of children were female, 14% had a disability as reported by parents, and 24% were below the poverty threshold. Parents' educational attainments were less than high school (15%), high school (22%), some college (30%), Bachelor's (21%), and graduate school or above (13%).

Variables

The variables used in this study are described below. The variables were recoded as needed from the raw variables in the data set. Cronbach's reliabilities are reported for waves 1-4. (See Appendix B for more information on the variables.)

Child characteristics. *Child gender* was coded as 0 (Male) or 1 (Female). *Child race* was recoded into four dummy coded race variables, with White as the reference group compared to Black, Hispanic, Asian, and Other (Native Hawaiian/Pacific Islander, American Indian/Alaska Native, more than one race). *Child age* was the child's age in months at the time of direct cognitive assessments; age was mean-centered. *Child disability status* was coded as 0 (No) or 1 (Yes) based on parent report.

Child reading achievement. Cognitive assessments were individually administered to each child using two-stage adaptive tests. All children began with a routing test, which determined difficulty level (low, middle, or high) for the second-stage test. Assessment times were approximately 60 minutes; assessors administered the assessments using easels and read the

questions out loud. The *reading achievement* assessment measured language use and literacy, including questions that measure basic skills (e.g., print familiarity, letter recognition) and vocabulary knowledge. Reading comprehension questions asked children to identify information in the text, make inferences, and evaluate. Scores were estimates from item response theory (IRT) models. IRT-based scale scores ranged from 0 to 100, and from kindergarten to first grade, reliabilities ranged from .93 to .95. For this study, reading achievement was mean-centered, with scores representing average reading achievement at spring of first grade. Individual reading achievement scores were mean-centered.

Child problem behavior and social skills. Teachers reported on children's behavior using an adapted version of the Social Skills Rating System (SSRS) from Gresham and Elliot (1990). *Internalizing problem behavior* ($\alpha = .76-.79$) measured the presence of anxiety, loneliness, low self-esteem, and sadness. *Externalizing problem behavior* ($\alpha = .88-.89$) measured the presence of acting out behaviors, including fights, arguments, and impulsive acts. *Interpersonal skills* measured the ability to relate and interact with others, including expressing feelings, and sharing ideas and opinions. Items were measured on a scale from 1 (Never) to 4 (Very often).

Family socioeconomic status. Household *poverty status* was determined by comparing household income to thresholds from the U.S. Census Bureau, coded as 0 (Below poverty threshold) and 1 (At or above the poverty threshold). *Parent education* was measured as the highest level of education achieved by the main parent who was interviewed (for many it was the mother). The variable was recoded into five dummy coded parent education variables, with High School as the reference group compared to Less Than High School, Some College, Bachelor's, and Graduate School or Higher.

Parent-child warmth. Parents reported on the warmth of parent-child relationship with one item, measured on a scale from 1 (Completely true) to 4 (Not at all true).

Teacher expectations. In spring of first grade, teachers reported on the child's educational prospects using a single item with four points, 1 (Less than high school diploma), 2 (Graduate from high school), 3 (Finish a four- or five-year college degree), and 4 (Earn an advanced degree). For this study, this variable was treated as continuous.

Teacher-child relationship. Teachers reported on the quality of the student-teacher relationship using two subscales from the Student-Teacher Relationship Scale (Pianta, 2001): closeness ($\alpha = .86-.89$) and conflict ($\alpha = .89$). The *closeness* scale measured affection, warmth, and open communication between the teacher and student. The *conflict* scale measured teacher's perception of negative and conflicting aspects of the relationship. There was a total of 15 items (8 conflict and 7 closeness) measured on a scale from 1 (Definitely does not apply) to 5 (Definitely applies).

School type. School administrators reported on the type of school, public or private. This information was also gathered from school records.

School-level aggregates. School-level aggregates were created for each individual-level predictor. The school-level variables represented school-level means for each variable. For example, the mean reading achievement was calculated for each school, and each child in the same school had the same school mean reading achievement score.

Statistical Analysis

The research questions were investigated using multivariate, multilevel regression analysis using R (*lme4*) and Stata IC 14.0. For this study, teacher-child closeness and conflict scores were dependent variables. Wave 4 (spring first grade) variables were used; where wave 4

was not available (parent-child warmth), other waves were used. Two models were built: (1) Model 1: null/empty model and (2) Model 2: full model with all variables. All predictors were added to the model at the same time in each model. The general equations for the full model are shown and described below:

$$\text{Level 1: } relationship_{ij} = \beta_{0j} + \beta_{1-4}race + \beta_5gender + \beta_6social + \beta_7expect + \beta_8expect * gender + \beta_{9-12}expect * race + \beta_{13-23}controls + \beta_{24-50}school + \varepsilon_{ij} \quad (1)$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{024-050}school + u_{0j} \quad (2)$$

$$\beta_{7j} = \gamma_{70} + \gamma_{728-731}school + u_{7j} \quad (3)$$

where, $relationship_{ij}$ is teacher-child closeness or conflict scores for child i in school j ; β_{0j} is the intercept, which is the mean closeness or conflict scores across the entire sample when predictors are zero; β_{1-4} are coefficients for race variables, with White as the reference group; β_{5-7} are coefficients for gender, social skills, and teacher expectations, respectively; β_{8-12} are the coefficients for the interaction terms between teacher expectations and gender and race; β_{13-23} are coefficients for control variables; β_{24-47} are coefficients for the school-level aggregates of each individual-level predictor; and ε_{ij} is the error term for child i .

At level 2, γ_{00} is the grand mean of closeness or conflict; $\gamma_{024-047}$ are the coefficients for the effect of school-level aggregates on the intercept; γ_{70} is grand mean of teacher expectations slope across all schools; $\gamma_{728-731}$ are coefficients for the effect school-level aggregates on the slope of teacher expectations; and u_{0j} and u_{7j} are the error terms for the level-2 equations, representing variance in average closeness or conflict among schools and average teacher expectation slopes, respectively. The slopes of other variables were not estimated to be random in this study.

Sampling weights. Sampling weights were available in the data set to adjust for differential sampling and response rates; weights allow for estimates to generalize to the larger

population of U.S. children who attended kindergarten in 2010-11. This study used the “W4C4P_4T0” provided for in the data set. Raw sampling weights, however, cannot be used with multi-level models and can produce biased results; weights need to be scaled (Asparouhov, 2006; Carle, 2008). Two scaling methods proposed in the literature were used to rescale raw sampling weights:

$$\text{Scaling method A: } w_{ij}^* = w_{ij} \left(\frac{n_j}{\sum_i w_{ij}} \right) \quad (4)$$

$$\text{Scaling method B: } w_{ij}^* = w_{ij} \left(\frac{\sum_i w_{ij}}{\sum_i w_{ij}^2} \right) \quad (5)$$

Data set limitations. The data were nested, with students in classrooms in schools. However, in this study, only the school level was modeled because the teacher-level identification variables were suppressed (for confidentiality purposes) in the public-use data set. Therefore, the teacher-level cannot be modeled, and teacher-level characteristics were not available to be added. In addition, for scales with multiple items, composites were used because item-level data were not available; therefore, scale variables included in this study were considered observed. Thus, findings were interpreted with these limitations in mind.

Chapter 4: Results

Descriptive Statistics

Table 1 shows descriptive statistics and proportions for variables included in the study. Children’s average age at spring of first grade was 7.08 years. Children had relatively low internalizing problem behavior ($M = 1.53$, $SD = .50$) and externalizing problem behavior ($M = 1.71$, $SD = .60$), and high interpersonal skills ($M = 3.15$, $SD = .64$). The average reading achievement score at spring was 70.04 ($SD = 12.72$). The unweighted average scores reported for the larger sample are similar to the weighted means and standard deviations reported in the manual (Tourangeau et al., 2015).

Teachers reported relatively high closeness scores ($M = 4.27$, $SD = .68$) and low conflict scores ($M = 1.61$, $SD = .77$). Moreover, teachers reported slightly above average expectations ($M = 2.89$, $SD = .76$) for students. At the school level, approximately 55% of children were minority, non-White students, 45% qualified for free lunch, roughly 9% of children were enrolled in private schools.

Table 2 shows bivariate, Pearson correlations among variables; the relations between variables were significant and in the expected directions. Teacher-child closeness and conflict were negatively related ($r = -.31$). Teachers who reported close relationships with children also reported low conflict. Teacher-child closeness was positively related to teacher expectations ($r = .22$) and teacher-child conflict was negatively related to teacher expectations ($r = -.30$). Teachers who had high expectations for children reported higher positive and lower negative relationships.

Children's reading achievement scores were positively related to teacher-child closeness ($r = .19$) and negatively related to teacher-child conflict ($r = -.19$). Teachers reported higher quality relationships and lower conflict with children who were more academically successful in reading. Children's internalizing problem behavior was negatively related to teacher-child closeness ($r = -.19$) and positively related to teacher-child conflict ($r = .35$). Teachers reported lower positive relationships and more conflict with children who show signs of social withdrawal, anxiety, sadness, etc.

Similarly, children's externalizing problem behavior was negatively related to teacher-child closeness ($r = -.16$) and positively related to teacher-child conflict ($r = .74$). Teachers reported lower positive relationships and more conflict with children who show signs of acting out (e.g., impulsivity, aggression). In addition, child interpersonal skills was positively related to teacher-child closeness ($r = .47$) and negatively related to teacher-child conflict ($r = -.63$).

Teachers reported higher quality relationships and lower conflict with children who had more social skills.

Moreover, teacher-child closeness was negatively related to the percentages of minority students ($r = -.12$) and free lunch ($r = -.10$) in the school. Teachers reported lower positive relationships with children in schools with a higher percentage of minority, non-White students and students who qualify for free lunch. The percentage of minority students and free lunch were also significantly related to teacher-child conflict ($r = .05$, both), although the magnitude of this correlation was not large. Teachers reported higher conflicting relationships with children in schools with a higher percentage of minority, non-White students and students who qualify for free lunch.

Table 1. *Descriptive Statistics*

Variable	<i>N</i>	<i>M/Proportion</i>	<i>SD</i>	Min	Max
Child Demographics					
White	3636	.41			
Black	3636	.10			
Hispanic	3636	.35			
Asian	3636	.08			
Other	3636	.07			
Gender (female)	3642	.48			
Age (spring of 1st grade)	3620	84.96	4.03	73.08	102.40
Disability	2791	.14			
Poverty status	3054	.27			
Parent Variables					
Less than high school	3054	.14			
High school	3054	.22			
Some college	3054	.29			
Bachelor	3054	.21			
Graduate school or above	3054	.14			
Parent-child warmth	2747	1.27	.56	1.00	4.00
Child Achievement, Behavior, and Skills					
Reading achievement	3618	70.04	12.72	26.40	94.84
Internalizing problem behavior	3585	1.53	.50	1.00	4.00
Externalizing problem behavior	3606	1.71	.60	1.00	4.00
Interpersonal skills	3579	3.15	.64	1.00	4.00
Teacher Variables					
Teacher-child closeness	3643	4.27	.68	1.00	5.00
Teacher-child conflict	3643	1.61	.77	1.00	5.00
Teacher expectations	3577	2.89	.76	1.00	4.00
School Variables					
Percent minority	3624	54.83	33.54	1.00	100.00
Percent free lunch	3640	45.10	33.16	.00	100.00
Private	3640	.09			

Table 2. *Correlations Among Predictors and Outcome Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Teacher-child closeness	----										
2. Teacher-child conflict	-.31**	----									
3. Teacher expectations	.22**	-.30**	----								
4. Child age	.03	-.00	.03*	----							
5. Child reading achievement	.19**	-.19**	.54**	.08**	----						
6. Child internalizing problem	-.19**	.35**	-.25**	-.01	-.22**	----					
7. Child externalizing problem	-.16**	.74**	-.28**	-.02	-.18**	.27**	----				
8. Child interpersonal skills	.47**	-.63**	.34**	.02	.26**	-.33**	-.61**	----			
9. Parent-child warmth	-.08**	.05**	-.06**	-.00	-.06*	.03	.04*	-.04	----		
10. School percent minority	-.12**	.05**	-.11**	-.11**	-.27**	.00	.03	-.05**	.03	----	
11. School percent free lunch	-.10**	.05**	-.20**	-.03	-.31**	.01	.05**	-.04	.04*	.67**	----

Note. * $p < .05$; ** $p < .01$

Unweighted versus Weighted Results

The data were analyzed in three ways: unweighted, weighted method A, and weighted method B (see Appendix C for results of all approaches). Carle (2008) recommended comparing results from different methods to cross validate. Overall, results from the three approaches were not substantially different. There were, however, inferential differences (i.e., one effect was significant in one approach but not another). These discrepancies were noted and interpreted with caution. Carle (2008) also recommended scaling method A for data with large cluster sizes ($n > 20$). Thus, I reported and interpreted results from weighted method A.

Models with Conflict Outcome

Model 1. Table 3a shows parameter estimates for two-level models with teacher-child conflict as the outcome variable, using weighted method A. Model 1, the null model, showed the intraclass correlation (ICC), or proportion of variance at the school level in the intercept was 39%; the ICC for the teacher expectations slope was 3%. These results suggested that the average teacher-child conflict score and slope of teacher expectations varied between schools. Therefore, a two-level, random-effects model was preferred over a one-level model.

Model 2. Model 2 included the individual-level variables as well as the school-level aggregates, along with the interactions and cross-level effects. The proportion of variance in the intercept explained by adding the predictors was 57%. The proportion of variance in the teacher expectations slope explained by adding the predictors was 70%. Overall, these results suggested the predictors in the full model explained over half of the between school variance in the intercept and slightly less than three-fourths of the between school variance in the slope of teacher expectations.

Significant, fixed effects on conflict were interpreted as the variable's effect on teacher-child conflict scores, with the average child (e.g., white, male, mean age, no poverty, etc.) in the average school (e.g., no minority, all male, public) as the reference. There were eleven significant predictors.

Children with higher interpersonal skills had lower conflict scores ($\beta_6 = -.36$). Children with higher teacher expectations had lower conflict scores ($\beta_7 = -.10$). Children with higher parent-child warmth in kindergarten had higher conflict scores ($\beta_{20} = .04$). (This effect was not significant in the unweighted and weight method B results; therefore, it was interpreted with caution.) Children with higher reading achievement had higher conflict scores ($\beta_{21} = .003$), but since the magnitude of the coefficient was close to zero, it was not interpreted further. Children with higher internalizing problem behavior had higher conflict scores ($\beta_{22} = .13$), and children with higher externalizing problem behavior had higher conflict scores ($\beta_{23} = .66$).

The school-level aggregates of variables represented the effect of the average school mean of the variable on teacher-child conflict. There were two significant school-level main effects. Schools with a higher level of internalizing problem behavior had higher conflict scores ($\beta_{50} = .17$). Schools with a higher level of externalizing problem behavior had lower conflict scores ($\beta_{51} = -.17$). There were three significant interaction effects. For schools with a higher proportion of Asian students, higher teacher expectations were associated with higher conflict scores ($\beta_{30} = .44$). For schools with a higher proportion of Hispanic students, higher school-level teacher expectations were associated with higher conflict scores ($\beta_{35} = .36$). For schools with a higher proportion of students in poverty, higher school-level teacher expectations were associated with lower conflict scores ($\beta_{38} = -.45$). These interaction effects were displayed in Figures 1-3.

Table 3a. *Parameter Estimates for Two-Level Models with Conflict – Weighted Method A*

	Null Model (1)		Full Model (2)	
Fixed Effects	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	2.459	0.064	1.806	0.731*
Black (β_1)			0.307	0.185
Hispanic (β_2)			-0.236	0.144
Asian (β_3)			0.514	0.305
Other (β_4)			-0.322	0.197
Gender (β_5)			-0.017	0.084
Interpersonal skills (β_6)			-0.363	0.024***
Teacher expectations (β_7)	-0.298	.020	-0.098	0.041*
Teacher expectations X Gender (β_8)			0.000	0.027
Teacher expectations X Black (β_9)			-0.049	0.063
Teacher expectations X Hispanic (β_{10})			0.066	0.048
Teacher expectations X Asian (β_{11})			-0.160	0.089
Teacher expectations X Other (β_{12})			0.107	0.065
Age (β_{13})			0.003	0.003
Disability (β_{14})			0.004	0.032
Poverty status (β_{15})			0.007	0.031
Less high school (β_{16})			-0.048	0.042
Some college (β_{17})			-0.048	0.030
Bachelor (β_{18})			-0.038	0.036
Graduate school (β_{19})			0.013	0.041
Parent-child warmth (β_{20})			0.042	0.019*
Reading (β_{21})			0.003	0.001*
Internalizing problem behavior (β_{22})			0.129	0.023***
Externalizing problem behavior (β_{23})			0.662	0.024***
S-Black (β_{24})			0.723	0.561
S-Hispanic (β_{25})			-0.739	0.431
S-Asian (β_{26})			-0.009	0.838
S-Other (β_{27})			-0.045	0.742
S-Black X Teacher expectations (β_{28})			0.090	0.126
S-Hispanic X Teacher expectations (β_{29})			-0.100	0.091
S-Asian X Teacher expectations (β_{30})			0.436	0.147**
S-Other X Teacher expectations (β_{31})			-0.253	0.163
S-Poverty X Teacher expectations (β_{32})			0.184	0.103
S-Teacher expectations (β_{33})			0.068	0.076
S-Black X S-Teacher expectations (β_{34})			-0.341	0.209
S-Hispanic X S-Teacher expectations (β_{35})			0.355	0.153*
S-Asian X S-Teacher expectations (β_{36})			-0.454	0.285
S-Other X S-Teacher expectations (β_{37})			0.335	0.282
S-Poverty X S-Teacher expectations (β_{38})			-0.448	0.183*
S-Gender (β_{39})			-0.092	0.075
S-Interpersonal skills (β_{40})			0.054	0.060
S-Age (β_{41})			-0.005	0.007
S-Disability (β_{42})			0.054	0.097
S-Poverty status (β_{43})			0.615	0.450
S-Less high school (β_{44})			0.195	0.115
S-Some college (β_{45})			-0.011	0.098
S-Bachelor (β_{46})			-0.086	0.112
S-Graduate school (β_{47})			-0.151	0.127
S-Parent-child warmth (β_{48})			-0.038	0.058
S-Reading (β_{49})			0.001	0.003
S-Internalizing problem behavior (β_{50})			0.172	0.071*
S-Externalizing problem behavior (β_{51})			-0.166	0.068*
Private (β_{52})			-0.029	0.049
Random Effects				
Intercept	.383		.165	
Expectations	.027		.008	
Residual	.580		.222	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$



Figure 1. The interaction of school Asian population and teacher expectations on teacher-child conflict.

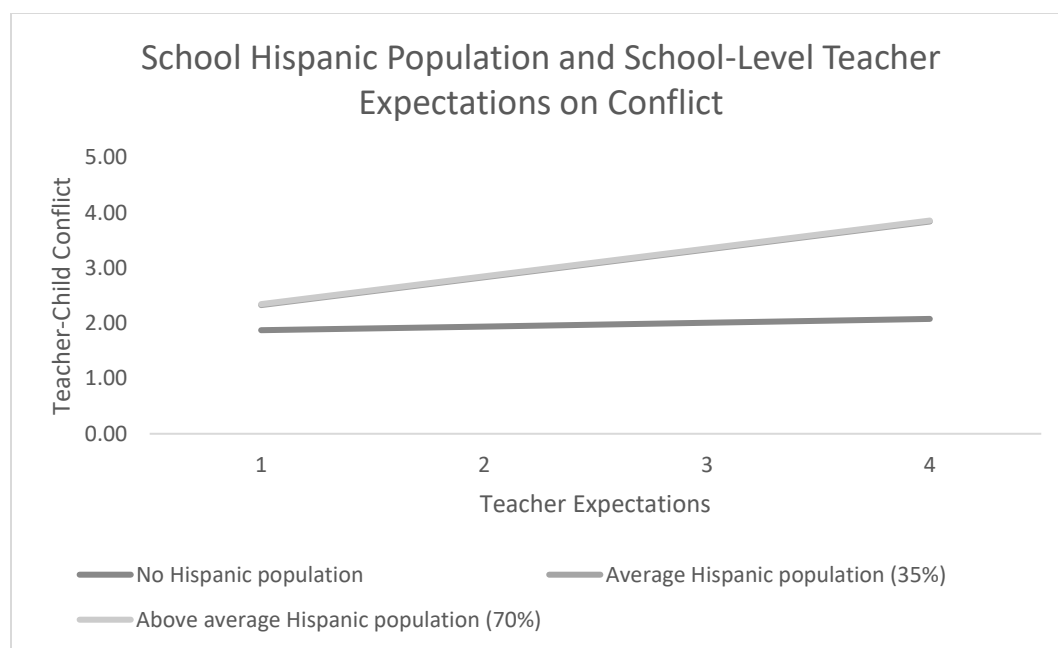


Figure 2. The interaction of school Hispanic population and school-level teacher expectations on teacher-child conflict.

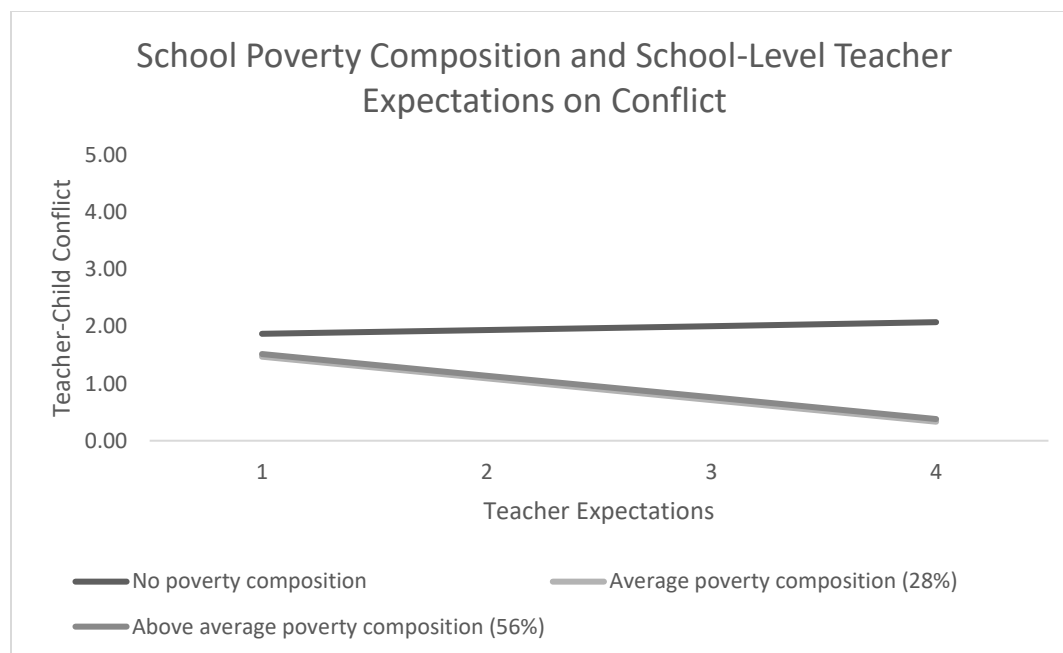


Figure 3. The interaction between school poverty composition and school-level teacher expectations on teacher-child conflict.

Models with Closeness Outcome

Model 1. Table 4a shows parameter estimates for two-level models with teacher-child closeness as the outcome variable, using weighted method A. Model 1, the null model, showed the intraclass correlation (ICC), or proportion of variance at the school level in the intercept was 51%; the ICC for the teacher expectations slope was 3%. These results suggested that the average teacher-child closeness score and slope of teacher expectations did vary between schools. Therefore, a two-level, random effects model was preferred over a one-level model.

Model 2. Model 2 included the individual-level variables as well as the school-level aggregates, along with the interactions and cross-level effects. The proportion of variance in the intercept explained by adding the predictors was 17%. The proportion of variance in the teacher expectations slope explained by adding the predictors was 4%. Overall, these results suggested the predictors in the full model only explained 17% of the between school variance in the

average teacher-child closeness score and 4% of the between school variance in the slope of teacher expectations. Compared to the conflict model, these predictors were not able to capture as much variation between schools.

Significant, fixed effects were interpreted as the variable's effect on teacher-child closeness scores, with the average child (e.g., white, male, mean age, no poverty, etc.) in the average school (e.g., no minority students, public) as the reference. There were eight significant predictors. Children with higher interpersonal skills had higher closeness scores ($\beta_6 = .55$). Children in poverty had lower closeness scores ($\beta_{15} = -.09$). Children with higher internalizing problem behavior had lower closeness scores ($\beta_{22} = -.10$), and children with higher externalizing problem behavior had higher closeness scores ($\beta_{23} = .25$).

The school-level aggregates of variables represented the effect of the average school mean of the variable on teacher-child closeness. There were two significant school-level main effects. Schools with more female students had higher closeness scores ($\beta_{39} = .23$). Schools with a greater proportion of older students had higher closeness scores ($\beta_{41} = .02$). (These two main effects were not significant in the unweighted and weight method B results; therefore, they were interpreted with caution.) There was one significant interaction effect. For schools with a higher proportion of Asian students, higher school-level teacher expectations were associated with higher closeness scores ($\beta_{36} = .82$). The interaction effect was displayed in Figure 4.

Table 4a. *Parameter Estimates for Two-Level Models with Closeness – Weighted Method A*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	3.651	0.061	0.229	0.957
Black (β_1)			-0.224	0.217
Hispanic (β_2)			-0.050	0.169
Asian (β_3)			-0.201	0.357
Other (β_4)			-0.359	0.228
Gender (β_5)			0.129	0.099
Interpersonal skills (β_6)			0.547	0.027***
Teacher expectations (β_7)	0.212	0.019	0.036	0.051
Teacher expectations X Gender (β_8)			0.006	0.032
Teacher expectations X Black (β_9)			0.034	0.075
Teacher expectations X Hispanic (β_{10})			0.010	0.057
Teacher expectations X Asian (β_{11})			0.035	0.105
Teacher expectations X Other (β_{12})			0.075	0.075
Age (β_{13})			-0.003	0.003
Disability (β_{14})			-0.037	0.037
Poverty status (β_{15})			-0.092	0.036*
Less high school (β_{16})			0.004	0.048
Some college (β_{17})			0.047	0.035
Bachelor (β_{18})			0.035	0.042
Graduate school (β_{19})			0.059	0.047
Parent-child warmth (β_{20})			-0.033	0.022
Reading (β_{21})			-0.001	0.001
Internalizing problem behavior (β_{22})			-0.099	0.027***
Externalizing problem behavior (β_{23})			0.250	0.028***
S-Black (β_{24})			0.974	0.707
S-Hispanic (β_{25})			0.096	0.555
S-Asian (β_{26})			-1.845	1.119
S-Other (β_{27})			1.547	0.949
S-Black X Teacher expectations (β_{28})			-0.100	0.157
S-Hispanic X Teacher expectations (β_{29})			0.023	0.114
S-Asian X Teacher expectations (β_{30})			-0.255	0.182
S-Other X Teacher expectations (β_{31})			-0.256	0.204
S-Poverty X Teacher expectations (β_{32})			0.044	0.131
S-Teacher expectations (β_{33})			0.080	0.100
S-Black X S-Teacher expectations (β_{34})			-0.164	0.265
S-Hispanic X S-Teacher expectations (β_{35})			-0.078	0.197
S-Asian X S-Teacher expectations (β_{36})			0.819	0.380*
S-Other X S-Teacher expectations (β_{37})			-0.154	0.361
S-Poverty X S-Teacher expectations (β_{38})			-0.146	0.230
S-Gender (β_{39})			0.233	0.097*
S-Interpersonal skills (β_{40})			0.026	0.079
S-Age (β_{41})			0.024	0.010*
S-Disability (β_{42})			0.014	0.125
S-Poverty status (β_{43})			0.212	0.570
S-Less high school (β_{44})			-0.104	0.147
S-Some college (β_{45})			-0.165	0.128
S-Bachelor (β_{46})			-0.111	0.147
S-Graduate school (β_{47})			0.139	0.168
S-Parent-child warmth (β_{48})			-0.007	0.074
S-Reading (β_{49})			-0.005	0.004
S-Internalizing problem behavior (β_{50})			-0.026	0.092
S-Externalizing problem behavior (β_{51})			-0.003	0.089
Private (β_{52})			0.091	0.069
Random Effects				
Intercept	.448		.372	
Expectations	.028		.027	
Residual	.410		.287	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$

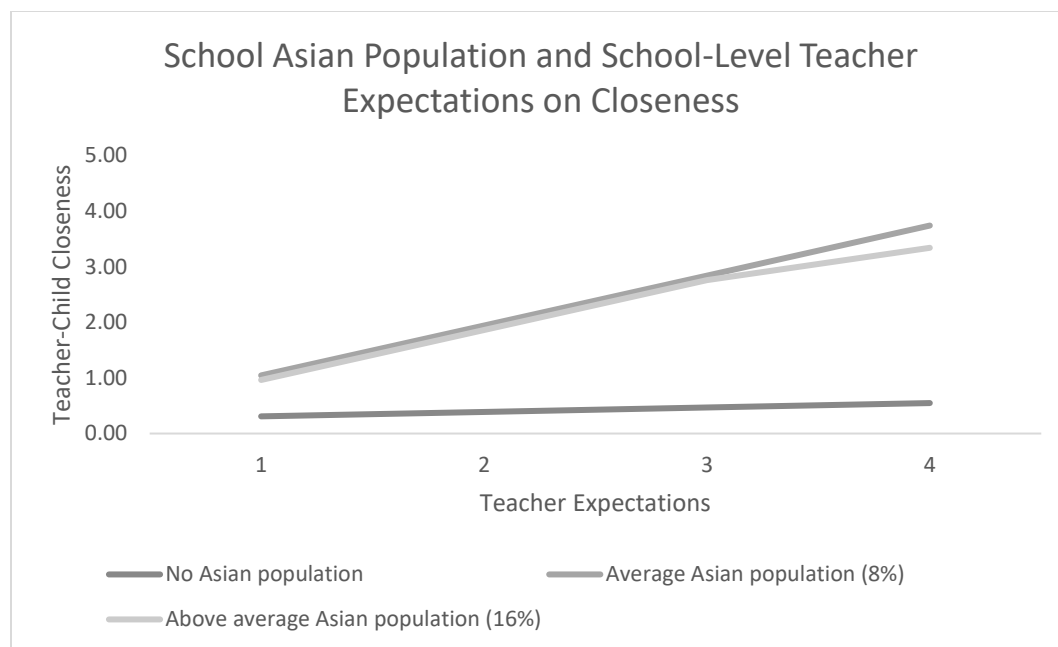


Figure 4. The interaction between school Asian population and school-level teacher expectations on teacher-child closeness.

Chapter 5: Discussion

The purpose of this study was to investigate the antecedent factors of teacher-child relationship quality. This study extended the existing literature by investigating the roles of child interpersonal skills, teacher expectations, and school racial and poverty compositions on teacher-child relationship quality, as measured by teacher-reported closeness and conflict. Using the ECLS-K:2011, two-level models of spring, first-grade teacher-child relationship quality were examined. Overall, the findings showed teacher-child conflict was predicted by interpersonal skills, reading achievement, parent-child warmth, teacher expectations, and child- and school-level internalizing and externalizing problem behaviors. In addition, school racial and poverty compositions moderated the effect of teacher expectations on teacher-child conflict. Moreover, teacher-child closeness was predicted by child-level interpersonal skills, poverty status, and internalizing and externalizing problem behaviors. At the school level, school proportion of

female students and older students were associated with higher closeness. In addition, school proportion of Asian population moderated the association between school-level teacher expectations and teacher-child closeness.

Child Race and Gender on Teacher-Child Relationship Quality

Findings from this study showed child-level race and gender were not significant predictors of teacher-child relationship quality. In contrast to previous studies that showed a difference in teacher-child conflict by student ethnicity—Black compared to White (Casteel, 1998; Jerome et al., 2009), this study found that child race variables did not statistically explain teacher-child relationship quality, when controlling for a wide range of covariates, including child skills, SES, teacher expectations, and school racial and poverty compositions. In other words, teacher-child relationship quality was more strongly associated with other factors (e.g., interpersonal skills) rather than child race. Similarly, the gender gap in relationship quality documented in previous studies (Baker, 2006; Hamre & Pianta, 2005; Kesner, 2000) was not replicated here when controlling for relevant variables. Overall, these findings suggest that child race and gender were not associated with relationship quality. Importantly, however, the relative absence of an association between child race and gender and relationship quality should not be interpreted as an absence of racial or gender gaps in teacher-child relationship quality. Other research indicates racial and gender gaps exist (e.g., Jerome et al., 2009; Kesner, 2000), but in this study, these gaps were not strongly related to teacher-child relationship quality at the individual level.

Findings from this study, however, point to school-level effects. Results indicate school-level racial and gender compositions were associated with relationship quality. There were no main effects of school racial composition on relationship quality. Rather, school racial

compositions moderated the association between teacher expectations and teacher-child relationship quality (in depth discussion in subsequent section). In addition, in schools with a higher proportion of female students, the level of teacher-child closeness was higher. These results suggest that the construct of closeness could be gendered; items on the measure may reflect socialization toward girl/female relationships qualities (e.g., shares feelings openly, being in tuned with feelings). The school-level gender effect, however, should be interpreted with caution because it was not significant in the unweighted and method B approaches. Thus, future research should replicate these results before strong conclusions can be drawn.

This study was only able to evaluate the partial effects of variables on teacher-child relationship quality (i.e., effect of being Black versus White on relationship quality), but it could not show whether there are differences in teachers' ratings due to bias (i.e., that teachers tend to rate Black children higher in conflict compared to White children) because teacher bias was not measured. Previous studies have shown that teachers have lower expectations for Black children compared to White children and associate Black children with more negative stereotypes (Piggott & Cowen, 2000; Tenenbaum & Ruck, 2007). Teachers' negative beliefs about minority children may influence the quality of relationships formed. Thus, future studies should evaluate the role of teachers' bias and stereotypes on teacher-child relationship quality.

Child Interpersonal Skills and Problem Behavior on Teacher-Child Relationship Quality

Findings from this study showed child internalizing and externalizing problem behaviors and interpersonal skills predicted teacher-child conflict and closeness. Similar to previous studies, children with high internalizing and externalizing problem behaviors had more conflicting relationships with teachers (Hamre & Pianta, 2005; Jerome et al., 2009; Murray & Murray, 2004). In addition, results showed children with high internalizing problem behavior

had lower closeness with teachers, replicating previous studies (Murray & Murray, 2004). In contrast, children with high externalizing problem behavior had *higher* closeness with teachers. This seemed to be a conceptually contradictory finding, especially when previous studies showed no effect of externalizing problem behavior on teacher-child closeness (Jerome et al., 2009; Murray & Murray, 2004; Thijs & Koomen, 2009). A possible explanation, however, is that children who show externalizing problem behavior may be more likely to come to their teachers for emotional support. The closeness subscale, according to the author, also measures the degree to which a teacher feels the student uses the teacher as a resource (Pianta, 2001). Teachers may feel closer and more effective in supporting students who show their feelings and frustrations (e.g., acting out, impulsivity) compared to children who are withdrawn or shy (i.e., internalizing problem behavior).

Moreover, at the school level, the levels of internalizing and externalizing problem behaviors were also associated with teacher-child conflict. Schools with higher levels of internalizing problem behavior had higher conflict scores, and schools with higher levels of externalizing problem behavior had lower conflict scores. In schools with more students who show internalizing problem behavior, teachers were more likely to report conflicting relationships with students. Teachers in these schools may find it difficult to relate to or understand the student population, resulting in more conflict. In contrast, in schools with more students who showed externalizing problem behavior (e.g., act out, impulsivity), teachers were less likely to report conflicting relationships with students. Teachers in these schools may find it easier to understand or interpret students' needs when they openly express their feelings and frustrations, thus resulting in less conflict.

Lastly, findings supported hypothesis 1, which states that child interpersonal skill was a unique predictor of teacher-child closeness and conflict. Children who had higher interpersonal skills were more likely to have lower conflict and higher closeness with teachers. This finding shows the importance of child social skills for developing positive relationships in the classroom. Much research and policy has focused on the importance of school readiness skills, social and cognitive, for children entering kindergarten (Graue, 2006). School readiness skills, particularly social skills, need to be explicitly taught in the classroom and by teachers who are socially and emotionally competent (Jennings & Greenberg, 2009). One way to achieve this is through the use of social emotional learning curriculums that have been shown to enhance children's socioemotional skills and academic performance (Durlak, Weissberg, Dymicki, Taylor, & Schellinger, 2011).

Family Characteristics on Teacher-Child Relationship Quality

Findings from this study showed family poverty status and parent-child warmth were significant predictors of teacher-child relationship quality. Teachers reported less closeness with children who live below the poverty line. On the one hand, this finding contrasted with a previous study (O'Connor & McCartney, 2006) that showed no effect of family income-to-needs ratio on relationship quality. On the other hand, consistent with previous studies (Hamre & Pianta, 2005; Jerome et al., 2009; O'Connor & McCartney, 2006), this study showed no association between parent education and the quality of teacher-child relationship. Though studies are not directly comparable because different analyses were conducted, in general, the results suggest family SES (income, education) is not strongly associated with teacher-child relationship quality, when accounting for other variables. This study, however, suggests there *is* a poverty gap associated with teacher-child closeness. A possible explanation for this gap could

be bias. First, the measure of teacher-child closeness may be biased in that the meaning of the construct is not applicable for low-SES children. The concept of close relationships, as defined by the measure, may not capture different ways that children from disadvantaged backgrounds demonstrate positive relationships. Second, teachers may be bias in their assessment of low-SES children. One study shows in low-income schools, teachers are more likely to use deficit-oriented statements about their students (Diamond et al., 2004). Teachers' biases of low-SES children may affect how they treat and form relationships with students. Future studies should conduct validation studies on the teacher-child relationship measure with a representative group of children (e.g., all ranges of SES) and explore possible explanations for the poverty gap.

Moreover, parent-child warmth in kindergarten was associated with more teacher-child conflict. This finding was surprising and in the opposite direction than expected, suggesting children who were closer to their parents had more conflicting relationships with their teachers. Results contrasted with a previous study that showed positive effects of secure maternal attachment on teacher-child relationship quality (O'Connor et al., 2006). One possible explanation for this study's finding is that children with strong parental relationships may be relying on that previous attachment relationship to inform relationships with teachers. Conflict may arise in the classroom if teaching styles differ significantly between teachers and parents (e.g., different methods of providing feedback). It is important to note that this effect was not significant in the weighted method B results. Therefore, future studies should replicate these results before a strong conclusion can be drawn.

Teacher Expectations and School Composition on Teacher-Child Relationship Quality

Findings from this study partially supported hypotheses 2 and 3. There was a unique main effect of teacher expectations on conflict: when teachers had high expectations for students,

teacher-child conflict was lower. This effect, however, was moderated by school racial composition. Compared to schools with no Asian students, in schools with average and higher proportions of Asian students, higher teacher expectations were associated with higher teacher-child conflict. Similar results were for school-level teacher expectations on teacher-child closeness. Compared to schools with no Asian students, in schools with average and higher proportions of Asian students, higher school-level teacher expectations were associated with higher teacher-child closeness. In general, other research indicates that teacher expectations are higher for Asian students compared to White students (Tenenbaum & Ruck, 2007). High expectations, however, may not be appropriate for all students or match with their current abilities. Unreasonable expectations could result in greater teacher-child conflict when students are unable to meet those expectations. At the same time, high expectations could promote closeness when expectations reflect teachers' confidence and support in students.

School-level teacher expectations were also moderated by the Hispanic student population. Compared to a school with no Hispanic students, in schools with average and higher levels of Hispanic students, higher school-level teacher expectations were associated with higher teacher-child conflict. In general, teacher expectations are lower for Hispanic students compared to White students (Tenenbaum & Ruck, 2007). This study's finding showed that in school where teacher expectations were low, the difference in teacher-child conflict between schools with low and high Hispanic population was smaller. In schools with high expectations and high Hispanic population, there may be more teacher-child conflict because teachers may not be setting appropriate expectations for Hispanic students (e.g., goals are not set at the level of the student).

Moreover, the association between teacher expectations on teacher-child conflict was moderated by school poverty composition. Compared to schools with no students in poverty, in

schools with average and above average poverty composition, higher school-level teacher expectations were associated with lower teacher-child conflict. Other research suggests that teacher expectations are lower for low-SES students (Diamond et al., 2004; Van den Bergh et al., 2010). The study finding shows high levels of expectations in a low-SES school may have positive effects by reducing teacher-child conflict. High teacher expectations can reduce conflict by signaling teacher confidence and belief in students, as well as teacher support for students' academic and social development.

Overall, these findings suggest teacher expectations do not operate in the same way across schools. Including the interactions of teacher expectations and school racial and poverty compositions made it possible to see the moderation. A strength of this study was the investigation of these interactions. Previous studies show differences in children's experiences at the classroom level (Baker, 1999; Howes & Smith, 1995) and school racial composition influence teachers' beliefs and expectations (Beady & Hansell, 1981; Diamond et al., 2004). The study findings support previous studies by showing that the relation between teachers' expectations and relationship quality differs based on school racial and poverty compositions. The differences may be due to a lack of fit between minority and low-income students in school systems designed for White, middle-class students. Teachers may be using expectations designed for the majority, privileged students in schools with minority students. These expectations may not be culturally sensitive or appropriately scaffolded, leading to higher conflict with students. Future studies should explore these interactions more in depth by looking at how school cultures and organizational processes promote teacher expectations and teacher interactions with students.

Limitations

A few limitations of this study should be considered. First, children who were Native Hawaiian/Pacific Islander, American Indian/Alaska Native, or multi-racial were put into one category: Other. Thus, it is difficult to interpret the results for this group of children. Future studies should consider separating children into their own categories when sample size permits. Second, this study included a variety of child and family characteristics as covariates, but there is a potential for omitted variable bias; not including relevant variables (e.g., maternal attachment, child temperament) that are also associated with relationship quality will bias estimates. Third, teacher expectation is a broad concept and can be conceptualized in different ways regarding different subjects (Good, 1987). Teachers' expectations were operationalized and assessed in this study as children's future educational potential. Future studies should look at teachers' expectations in other areas, including current achievement and social interactions.

Fourth, this study did not consider the nesting of children within classrooms or teachers, due to limitations in the public-use data set. The results, then, are not unbiased and do not take into account that children within classrooms are more similar to each other. Follow up studies should not only account for the classroom nesting but also look at teacher characteristics that are associated with relationship quality. There is some evidence that ethnicity, specifically a match between teacher and child ethnicity, is associated with teacher-child relationship quality (Dee, 2005; Kesner, 2000; Saft & Pianta, 2001). When there is a match between teacher's and children's ethnicity, teachers are less likely to perceive students negatively and to have conflicting relationships. There is also evidence that less teaching experience is associated with lower positive teacher-child relationship in kindergarten (O'Connor & McCartney, 2006). Future

studies should evaluate the impact of teacher characteristics and the interactions with child characteristics on teacher-child relationship quality.

Finally, the role of teacher or school bias was not directly assessed in this study. The regression models were only able to account for unique effects of child race and gender (i.e., effect of being Black or female) on relationship quality. The models cannot account for classroom and school biases (e.g., teacher stereotypes, school inequality) that can influence relationship quality, regardless of child race or gender. The role of teacher or school biases on teacher-child relationship quality can only be assessed by directly measuring and testing the effects of those variables.

Conclusion

High-quality positive relationships with teachers are known to promote better academic, social, and school engagement outcomes (Baker, 2006; Birch & Ladd, 1997; Pianta & Stuhlman, 2004). Enhancing classroom relationships, then, is an indirect way to promote child outcomes. This study offers insights into antecedent factors that influence the development of teacher-child relationship quality. Overall, findings point to the importance of considering the school context. The association between teacher expectations and relationship quality varies by school racial and poverty compositions. Social processes, like the student-teacher relationship, need to be studied in context. How teachers interact and engage with children is influenced by the school structure, climate, and overall belief system. The student-teacher relationship, however, is only one process within the school microsystem. Future research should investigate other processes, such as the quality of peer relationships among students, interactions between teachers and administrators, as well as interactions between teachers.

Implications for Research and Practice

These findings have implications for intervention efforts and teacher education. Intervention efforts should focus on improving children's socioemotional skills through early childhood programming or socioemotional classroom curriculum. Research shows the positive effects of social emotional learning on academic outcomes, as well as social and self-regulation outcomes (Durlak et al., 2011). In addition, it is also important that teachers themselves are socially and emotionally competent and sensitive to the needs of their students (Jennings & Greenberg, 2009). Much research has pointed to the importance of developing the whole child, but relatively little research has looked at developing the whole teacher. Moreover, it has been suggested that raising teachers' expectations for Black students may improve student performance (Ferguson, 2003). Given the study findings, this suggestion may not be effective for Asian and Hispanic students. Rather, researchers and practitioners should consider the types of expectations that are set and how expectations are communicated to students. Training programs for pre-service teachers can focus on how to set expectations, as well as sources of biases that may affect those expectations. Pre-service teachers should also get practical experience with the students they plan to serve (e.g., student teach in an urban school before they serve in an urban school); the experience is important for knowing, understanding, and connecting with the students they serve. High-quality student-teacher relationships are essential to engage students emotionally and academically. Promoting interventions and professional development that target relationship development should be focus of practice and policy.

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Appendices

Appendix A

Figure A1: Conceptual Model

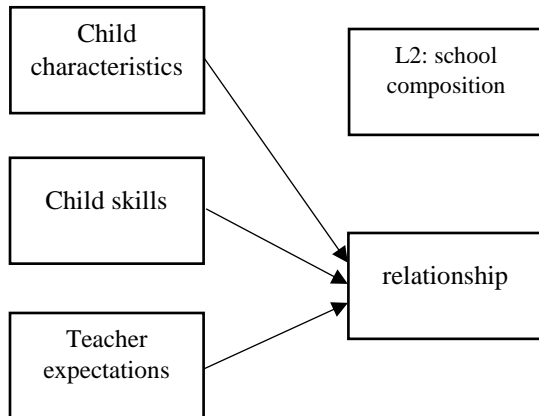


Figure A1. A conceptual model of the roles of child characteristics and skills and teacher expectations on teacher-child relationship quality. *Child characteristics* = child age, gender, race, SES, disability status, poverty status, and parent-child warmth; *child skills* = child reading achievement, internalizing and externalizing problems, and interpersonal skills; *L2* = level 2; *school composition* = school percentage of minority, free lunch, school type; and *relationship* = teacher-child relationship closeness and conflict.

Appendix B

Variables and Measures

Child Demographics:

Gender – Variable for sex of child, 0 = Male, 1 = Female. [Recoded from X_CHSEX_R]

Age – Child’s age in months at time of assessment. [X4AGE]

Disability – Child’s current disability status, coded as 0 = No, 1 = Yes. [Recoded from X4DISABL2]

Black – Dummy coded race variable, 1 = Black, 0 = Other. Child’s race/ethnicity is Black or African American, not Hispanic. [Recoded from X_RACETH_R]

Hispanic – Dummy coded race variable, 1 = Hispanic, 0 = Other. Child’s race/ethnicity is Hispanic, race or no race specified. Information obtained from parent interviews and school records. [Recoded from X_RACETH_R]

Asian – Dummy coded race variable, 1 = Asian, 0 = Other. Child’s race/ethnicity is Asian, not Hispanic. [Recoded from X_RACETH_R]

Other – Dummy coded race variable, 1 = “Other”, 0 = Other. The “Other” group contains three categories: Native Hawaiian or other Pacific Islander, not Hispanic; American Indian or Alaska Native, not Hispanic; More than 1 race, not-Hispanic. [Recoded from X_RACETH_R]

Child Achievement, Behavior, and Skills:

Reading Achievement – Standardized (IRT-scaling) test of reading achievement. An untimed, individually administered cognitive test measuring language use and literacy. Reliabilities ranged from kindergarten to first grade ranged from .93 to .95. [X4RSCALK1]

Externalizing Problems – Five teacher-report items on children’s acting out behaviors: fights, arguments, acts impulsively, etc. [X4TCHEXT]

Internalizing Problems – Four teacher-report items on the presence of anxiety, loneliness, low self-esteem, and sadness. [X4TCHINT]

Interpersonal Skills – Five teacher-report items on children’s ability to relate and interact with others: expressing feelings, sharing ideas and opinions, etc. [X4TCHPER]

Parent Variables:

Parent-Child Warmth – The child and parent have warm, close times together. Ordinal from 1 = Completely true to 4 = Not at all true. [P2WARMCL]

Poverty Status – Household poverty status, determined by comparing household income to thresholds from the U.S. Census Bureau, 0 = At or Above the Poverty Threshold, 1 = Below Poverty Threshold. [Recoded from X4POVTY_I]

Less High School – Dummy coded parent education variable, 1 = Less than high school, 0 = Other. Highest education level obtained by the first parent's education level is less than high school, includes 8th grade or below and 9th to 12th grade. [Recoded from X4PAR1ED_I]

Some College – Dummy coded parent education variable, 1 = Some college/vocational/technical program, 0 = Other. Highest education level obtained by the first parent's education level is some college, vocational or technical program. [Recoded from X4PAR1ED_I]

Bachelor's – Dummy coded parent education variable, 1 = Bachelor's, 0 = Other. Highest education level obtained by the first parent's education level is a Bachelor's degree. [Recoded from X4PAR1ED_I]

Graduate school or higher – Dummy coded parent education variable, 1 = graduate school or higher, 0 = Other. Highest education level obtained by the first parent's education level is graduate/professional school or higher, includes Master's and Doctorate. [Recoded from X4PAR1ED_I]

Teacher Variables:

Teacher-Child Closeness – Measure of the affection, warmth, and open communication that the teacher experiences with the student. [X4CLSNSS]

Teacher-Child Closeness – Measure of teacher's perception of the negative and conflictual aspects of the teacher's relationship with the student. [X4CNFLCT]

Teacher Expectations – How far in school do you [the teacher] think this child will go? Continuous from 1-4. [T4EXPECT]

School Variables:

Percent Minority Students – Percentage of non-White students in school spring of 2011. [X4RCETH]

Percent Free Lunch – Percentage of student approved for free school lunch. [X4FMEAL_I]

School Type – Private or public school, coded as 1 = Private, 0 = Public. [X4PUBPRI]

Appendix C

Models: Unweighted, Weighted Method A, Weighted Method B

Table 3. *Parameter Estimates for Two-Level Models with Conflict - Unweighted*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	2.474	0.058	2.032	0.722**
Black (β_1)			0.214	0.192
Hispanic (β_2)			-0.199	0.146
Asian (β_3)			0.360	0.275
Other (β_4)			-0.240	0.189
Gender (β_5)			-0.041	0.083
Interpersonal skills (β_6)			-0.336	0.024***
Teacher expectations (β_7)	-0.302	.018	-0.119	0.039**
Teacher expectations X Gender (β_8)			0.007	0.027
Teacher expectations X Black (β_9)			-0.022	0.066
Teacher expectations X Hispanic (β_{10})			0.061	0.049
Teacher expectations X Asian (β_{11})			-0.118	0.079
Teacher expectations X Other (β_{12})			0.079	0.062
Age (β_{13})			0.005	0.003
Disability (β_{14})			0.023	0.032
Poverty status (β_{15})			-0.003	0.031
Less high school (β_{16})			-0.055	0.041
Some college (β_{17})			-0.053	0.031
Bachelor (β_{18})			-0.020	0.036
Graduate school (β_{19})			0.004	0.041
Parent-child warmth (β_{20})			0.035	0.019
Reading (β_{21})			0.003	0.001**
Internalizing problem behavior (β_{22})			0.133	0.023***
Externalizing problem behavior (β_{23})			0.668	0.023***
S-Black (β_{24})			0.575	0.547
S-Hispanic (β_{25})			-0.575	0.421
S-Asian (β_{26})			0.223	0.799
S-Other (β_{27})			-0.045	0.737
S-Black X Teacher expectations (β_{28})			0.063	0.124
S-Hispanic X Teacher expectations (β_{29})			-0.115	0.089
S-Asian X Teacher expectations (β_{30})			0.347	0.149*
S-Other X Teacher expectations (β_{31})			-0.267	0.164
S-Poverty X Teacher expectations (β_{32})			0.222	0.100*
S-Teacher expectations (β_{33})			0.087	0.073
S-Black X S-Teacher expectations (β_{34})			-0.240	0.206
S-Hispanic X S-Teacher expectations (β_{35})			0.314	0.149*
S-Asian X S-Teacher expectations (β_{36})			-0.456	0.273
S-Other X S-Teacher expectations (β_{37})			0.350	0.279
S-Poverty X S-Teacher expectations (β_{38})			-0.415	0.177*
S-Gender (β_{39})			-0.039	0.074
S-Interpersonal skills (β_{40})			0.045	0.059
S-Age (β_{41})			-0.007	0.007
S-Disability (β_{42})			0.019	0.095
S-Poverty status (β_{43})			0.451	0.438
S-Less high school (β_{44})			0.125	0.114
S-Some college (β_{45})			-0.015	0.096
S-Bachelor (β_{46})			-0.088	0.110
S-Graduate school (β_{47})			-0.081	0.124
S-Parent-child warmth (β_{48})			-0.074	0.057
S-Reading (β_{49})			-0.001	0.003
S-Internalizing problem behavior (β_{50})			0.142	0.069*
S-Externalizing problem behavior (β_{51})			-0.121	0.067
Private (β_{52})			-0.012	0.047

Random Effects		
Intercept	.264	.143
Expectations	.012	.006
Residual	.497	.194

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3a. *Parameter Estimates for Two-Level Models with Conflict – Weighted Method A*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	2.459	0.064	1.806	0.731*
Black (β_1)			0.307	0.185
Hispanic (β_2)			-0.236	0.144
Asian (β_3)			0.514	0.305
Other (β_4)			-0.322	0.197
Gender (β_5)			-0.017	0.084
Interpersonal skills (β_6)			-0.363	0.024***
Teacher expectations (β_7)	-0.298	.020	-0.098	0.041*
Teacher expectations X Gender (β_8)			0.000	0.027
Teacher expectations X Black (β_9)			-0.049	0.063
Teacher expectations X Hispanic (β_{10})			0.066	0.048
Teacher expectations X Asian (β_{11})			-0.160	0.089
Teacher expectations X Other (β_{12})			0.107	0.065
Age (β_{13})			0.003	0.003
Disability (β_{14})			0.004	0.032
Poverty status (β_{15})			0.007	0.031
Less high school (β_{16})			-0.048	0.042
Some college (β_{17})			-0.048	0.030
Bachelor (β_{18})			-0.038	0.036
Graduate school (β_{19})			0.013	0.041
Parent-child warmth (β_{20})			0.042	0.019*
Reading (β_{21})			0.003	0.001*
Internalizing problem behavior (β_{22})			0.129	0.023***
Externalizing problem behavior (β_{23})			0.662	0.024***
S-Black (β_{24})			0.723	0.561
S-Hispanic (β_{25})			-0.739	0.431
S-Asian (β_{26})			-0.009	0.838
S-Other (β_{27})			-0.045	0.742
S-Black X Teacher expectations (β_{28})			0.090	0.126
S-Hispanic X Teacher expectations (β_{29})			-0.100	0.091
S-Asian X Teacher expectations (β_{30})			0.436	0.147**
S-Other X Teacher expectations (β_{31})			-0.253	0.163
S-Poverty X Teacher expectations (β_{32})			0.184	0.103
S-Teacher expectations (β_{33})			0.068	0.076
S-Black X S-Teacher expectations (β_{34})			-0.341	0.209
S-Hispanic X S-Teacher expectations (β_{35})			0.355	0.153*
S-Asian X S-Teacher expectations (β_{36})			-0.454	0.285
S-Other X S-Teacher expectations (β_{37})			0.335	0.282
S-Poverty X S-Teacher expectations (β_{38})			-0.448	0.183*
S-Gender (β_{39})			-0.092	0.075
S-Interpersonal skills (β_{40})			0.054	0.060
S-Age (β_{41})			-0.005	0.007
S-Disability (β_{42})			0.054	0.097
S-Poverty status (β_{43})			0.615	0.450
S-Less high school (β_{44})			0.195	0.115
S-Some college (β_{45})			-0.011	0.098
S-Bachelor (β_{46})			-0.086	0.112
S-Graduate school (β_{47})			-0.151	0.127
S-Parent-child warmth (β_{48})			-0.038	0.058
S-Reading (β_{49})			0.001	0.003
S-Internalizing problem behavior (β_{50})			0.172	0.071*
S-Externalizing problem behavior (β_{51})			-0.166	0.068*
Private (β_{52})			-0.029	0.049
Random Effects				
Intercept	.383		.165	
Expectations	.027		.008	
Residual	.580		.222	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3b. *Parameter Estimates for Two-Level Models with Conflict – Weighted Method B*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	2.456	0.063	1.864	0.727
Black (β_1)			0.195	0.187
Hispanic (β_2)			-0.234	0.147
Asian (β_3)			0.438	0.313
Other (β_4)			-0.282	0.197
Gender (β_5)			-0.043	0.084
Interpersonal skills (β_6)			-0.356	0.024***
Teacher expectations (β_7)	-0.299	.020	-0.113	0.039**
Teacher expectations X Gender (β_8)			0.007	0.027
Teacher expectations X Black (β_9)			-0.008	0.065
Teacher expectations X Hispanic (β_{10})			0.067	0.049
Teacher expectations X Asian (β_{11})			-0.135	0.091
Teacher expectations X Other (β_{12})			0.101	0.065
Age (β_{13})			0.003	0.003
Disability (β_{14})			0.003	0.032
Poverty status (β_{15})			0.000	0.032
Less high school (β_{16})			-0.054	0.042
Some college (β_{17})			-0.051	0.031
Bachelor (β_{18})			-0.025	0.036
Graduate school (β_{19})			0.023	0.041
Parent-child warmth (β_{20})			0.035	0.019
Reading (β_{21})			0.003	0.001*
Internalizing problem behavior (β_{22})			0.131	0.023***
Externalizing problem behavior (β_{23})			0.663	0.024***
S-Black (β_{24})			0.731	0.538
S-Hispanic (β_{25})			-0.587	0.419
S-Asian (β_{26})			-0.001	0.817
S-Other (β_{27})			-0.083	0.716
S-Black X Teacher expectations (β_{28})			0.045	0.125
S-Hispanic X Teacher expectations (β_{29})			-0.121	0.091
S-Asian X Teacher expectations (β_{30})			0.387	0.152*
S-Other X Teacher expectations (β_{31})			-0.224	0.162
S-Poverty X Teacher expectations (β_{32})			0.213	0.103*
S-Teacher expectations (β_{33})			0.094	0.073
S-Black X S-Teacher expectations (β_{34})			-0.283	0.203
S-Hispanic X S-Teacher expectations (β_{35})			0.325	0.149*
S-Asian X S-Teacher expectations (β_{36})			-0.421	0.280
S-Other X S-Teacher expectations (β_{37})			0.324	0.271
S-Poverty X S-Teacher expectations (β_{38})			-0.415	0.177*
S-Gender (β_{39})			-0.061	0.074
S-Interpersonal skills (β_{40})			0.064	0.060
S-Age (β_{41})			-0.006	0.007
S-Disability (β_{42})			0.034	0.095
S-Poverty status (β_{43})			0.469	0.430
S-Less high school (β_{44})			0.172	0.115
S-Some college (β_{45})			-0.012	0.098
S-Bachelor (β_{46})			-0.078	0.112
S-Graduate school (β_{47})			-0.121	0.126
S-Parent-child warmth (β_{48})			-0.052	0.059
S-Reading (β_{49})			0.000	0.003
S-Internalizing problem behavior (β_{50})			0.174	0.069*
S-Externalizing problem behavior (β_{51})			-0.139	0.068*
Private (β_{52})			-0.024	0.048
Random Effects				
Intercept	.311		.143	
Expectations	.021		.006	
Residual	.446		.174	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4. *Parameter Estimates for Two-Level Models with Closeness - Unweighted*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	3.665	0.054	1.266	0.881
Black (β_1)			-0.298	0.226
Hispanic (β_2)			-0.111	0.171
Asian (β_3)			-0.131	0.323
Other (β_4)			-0.450	0.222*
Gender (β_5)			0.180	0.099
Interpersonal skills (β_6)			0.546	0.028***
Teacher expectations (β_7)	0.208	0.017	0.035	0.049
Teacher expectations X Gender (β_8)			-0.010	0.032
Teacher expectations X Black (β_9)			0.054	0.078
Teacher expectations X Hispanic (β_{10})			0.025	0.058
Teacher expectations X Asian (β_{11})			0.000	0.093
Teacher expectations X Other (β_{12})			0.099	0.073
Age (β_{13})			-0.002	0.003
Disability (β_{14})			-0.027	0.037
Poverty status (β_{15})			-0.082	0.037*
Less high school (β_{16})			0.030	0.048
Some college (β_{17})			0.040	0.036
Bachelor (β_{18})			0.036	0.042
Graduate school (β_{19})			0.051	0.048
Parent-child warmth (β_{20})			-0.045	0.022*
Reading (β_{21})			-0.001	0.001
Internalizing problem behavior (β_{22})			-0.098	0.027***
Externalizing problem behavior (β_{23})			0.257	0.028***
S-Black (β_{24})			0.808	0.659
S-Hispanic (β_{25})			-0.271	0.513
S-Asian (β_{26})			-1.559	1.003
S-Other (β_{27})			1.596	0.895
S-Black X Teacher expectations (β_{28})			-0.146	0.154
S-Hispanic X Teacher expectations (β_{29})			0.039	0.111
S-Asian X Teacher expectations (β_{30})			-0.112	0.183
S-Other X Teacher expectations (β_{31})			-0.205	0.206
S-Poverty X Teacher expectations (β_{32})			0.017	0.128
S-Teacher expectations (β_{33})			0.016	0.091
S-Black X S-Teacher expectations (β_{34})			-0.067	0.253
S-Hispanic X S-Teacher expectations (β_{35})			0.027	0.183
S-Asian X S-Teacher expectations (β_{36})			0.661	0.344
S-Other X S-Teacher expectations (β_{37})			-0.267	0.344
S-Poverty X S-Teacher expectations (β_{38})			-0.173	0.217
S-Gender (β_{39})			0.090	0.089
S-Interpersonal skills (β_{40})			0.012	0.072
S-Age (β_{41})			0.014	0.009
S-Disability (β_{42})			0.086	0.115
S-Poverty status (β_{43})			0.363	0.528
S-Less high school (β_{44})			-0.041	0.137
S-Some college (β_{45})			-0.132	0.116
S-Bachelor (β_{46})			-0.050	0.135
S-Graduate school (β_{47})			0.105	0.154
S-Parent-child warmth (β_{48})			-0.003	0.069
S-Reading (β_{49})			-0.003	0.003
S-Internalizing problem behavior (β_{50})			-0.010	0.084
S-Externalizing problem behavior (β_{51})			-0.041	0.081
Private (β_{52})			0.088	0.060
Random Effects				
Intercept	.303		.270	
Expectations	.020		.022	
Residual	.362		.260	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4a. *Parameter Estimates for Two-Level Models with Closeness – Weighted Method A*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	3.651	0.061	0.229	0.957
Black (β_1)			-0.224	0.217
Hispanic (β_2)			-0.050	0.169
Asian (β_3)			-0.201	0.357
Other (β_4)			-0.359	0.228
Gender (β_5)			0.129	0.099
Interpersonal skills (β_6)			0.547	0.027***
Teacher expectations (β_7)	0.212	0.019	0.036	0.051
Teacher expectations X Gender (β_8)			0.006	0.032
Teacher expectations X Black (β_9)			0.034	0.075
Teacher expectations X Hispanic (β_{10})			0.010	0.057
Teacher expectations X Asian (β_{11})			0.035	0.105
Teacher expectations X Other (β_{12})			0.075	0.075
Age (β_{13})			-0.003	0.003
Disability (β_{14})			-0.037	0.037
Poverty status (β_{15})			-0.092	0.036*
Less high school (β_{16})			0.004	0.048
Some college (β_{17})			0.047	0.035
Bachelor (β_{18})			0.035	0.042
Graduate school (β_{19})			0.059	0.047
Parent-child warmth (β_{20})			-0.033	0.022
Reading (β_{21})			-0.001	0.001
Internalizing problem behavior (β_{22})			-0.099	0.027***
Externalizing problem behavior (β_{23})			0.250	0.028***
S-Black (β_{24})			0.974	0.707
S-Hispanic (β_{25})			0.096	0.555
S-Asian (β_{26})			-1.845	1.119
S-Other (β_{27})			1.547	0.949
S-Black X Teacher expectations (β_{28})			-0.100	0.157
S-Hispanic X Teacher expectations (β_{29})			0.023	0.114
S-Asian X Teacher expectations (β_{30})			-0.255	0.182
S-Other X Teacher expectations (β_{31})			-0.256	0.204
S-Poverty X Teacher expectations (β_{32})			0.044	0.131
S-Teacher expectations (β_{33})			0.080	0.100
S-Black X S-Teacher expectations (β_{34})			-0.164	0.265
S-Hispanic X S-Teacher expectations (β_{35})			-0.078	0.197
S-Asian X S-Teacher expectations (β_{36})			0.819	0.380*
S-Other X S-Teacher expectations (β_{37})			-0.154	0.361
S-Poverty X S-Teacher expectations (β_{38})			-0.146	0.230
S-Gender (β_{39})			0.233	0.097*
S-Interpersonal skills (β_{40})			0.026	0.079
S-Age (β_{41})			0.024	0.010*
S-Disability (β_{42})			0.014	0.125
S-Poverty status (β_{43})			0.212	0.570
S-Less high school (β_{44})			-0.104	0.147
S-Some college (β_{45})			-0.165	0.128
S-Bachelor (β_{46})			-0.111	0.147
S-Graduate school (β_{47})			0.139	0.168
S-Parent-child warmth (β_{48})			-0.007	0.074
S-Reading (β_{49})			-0.005	0.004
S-Internalizing problem behavior (β_{50})			-0.026	0.092
S-Externalizing problem behavior (β_{51})			-0.003	0.089
Private (β_{52})			0.091	0.069
Random Effects				
Intercept	.448		.372	
Expectations	.028		.027	
Residual	.410		.287	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4b. *Parameter Estimates for Two-Level Models with Closeness – Weighted Method B*

Fixed Effects	Null Model (1)		Full Model (2)	
	Coefficient	SE	Coefficient	SE
Intercept (β_{0j})	3.673	0.058	1.161	0.876
Black (β_1)			-0.291	0.218
Hispanic (β_2)			-0.069	0.171
Asian (β_3)			-0.122	0.364
Other (β_4)			-0.361	0.229
Gender (β_5)			0.193	0.099
Interpersonal skills (β_6)			0.549	0.028***
Teacher expectations (β_7)	0.209	0.018	0.038	0.048
Teacher expectations X Gender (β_8)			-0.013	0.032
Teacher expectations X Black (β_9)			0.059	0.075
Teacher expectations X Hispanic (β_{10})			0.020	0.058
Teacher expectations X Asian (β_{11})			0.012	0.106
Teacher expectations X Other (β_{12})			0.075	0.075
Age (β_{13})			-0.002	0.003
Disability (β_{14})			-0.037	0.037
Poverty status (β_{15})			-0.088	0.037
Less high school (β_{16})			0.012	0.049
Some college (β_{17})			0.051	0.036
Bachelor (β_{18})			0.045	0.042
Graduate school (β_{19})			0.063	0.047
Parent-child warmth (β_{20})			-0.040	0.022
Reading (β_{21})			-0.001	0.001
Internalizing problem behavior (β_{22})			-0.111	0.027***
Externalizing problem behavior (β_{23})			0.264	0.028***
S-Black (β_{24})			0.772	0.640
S-Hispanic (β_{25})			-0.312	0.504
S-Asian (β_{26})			-1.901	1.005
S-Other (β_{27})			1.416	0.858
S-Black X Teacher expectations (β_{28})			-0.133	0.153
S-Hispanic X Teacher expectations (β_{29})			0.021	0.112
S-Asian X Teacher expectations (β_{30})			-0.233	0.184
S-Other X Teacher expectations (β_{31})			-0.227	0.200
S-Poverty X Teacher expectations (β_{32})			0.047	0.128
S-Teacher expectations (β_{33})			0.018	0.090
S-Black X S-Teacher expectations (β_{34})			-0.069	0.246
S-Hispanic X S-Teacher expectations (β_{35})			0.054	0.181
S-Asian X S-Teacher expectations (β_{36})			0.864	0.345*
S-Other X S-Teacher expectations (β_{37})			-0.190	0.330
S-Poverty X S-Teacher expectations (β_{38})			-0.227	0.214
S-Gender (β_{39})			0.086	0.089
S-Interpersonal skills (β_{40})			0.029	0.073
S-Age (β_{41})			0.015	0.009
S-Disability (β_{42})			0.065	0.114
S-Poverty status (β_{43})			0.395	0.513
S-Less high school (β_{44})			-0.040	0.137
S-Some college (β_{45})			-0.149	0.118
S-Bachelor (β_{46})			-0.093	0.135
S-Graduate school (β_{47})			0.115	0.153
S-Parent-child warmth (β_{48})			-0.015	0.070
S-Reading (β_{49})			-0.004	0.003
S-Internalizing problem behavior (β_{50})			0.002	0.083
S-Externalizing problem behavior (β_{51})			-0.027	0.081
Private (β_{52})			0.094	0.060
Random Effects				
Intercept	.349		.262	
Expectations	.023		.019	
Residual	.317		.229	

Note. S = school-level aggregates of individual-level predictors; * $p < .05$; ** $p < .01$; *** $p < .001$